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PENICILLIN AEROSOLIZATION IN THE TREATMENT OF SERIOUS RESPIRATORY INFECTIONS*

A Preliminary Report

MAURICE S. SEGAL, M.D.,† AND CLAIRE MACINTYRE RYDER, M.D.‡
BOSTON

AEROSOLS may be defined as suspensions of liquids or solids in air or oxygen. The use of bronchodilator, vasoconstrictor and chemotherapeutic agents by continuous aerosolization with streams of oxygen or compressed air has been employed in patients with asthma,[1–10] pulmonary emphysema,[4, 5] pneumonia,[11–14] gas poisoning[15–17] and other types of bronchopulmonary disease.[13, 14, 18–27] The value of such therapy can be appreciated if one recalls that the inner surface of the lung has an area five hundred times as great as the body surface and absorbs so rapidly as to give an effect similar to that of an intravenous injection. Furthermore, Krueger et al.[28] demonstrated in monkeys and mice, with India ink and with radioactive chromic phosphate as indicators, that with inhalation the material was uniformly distributed and penetrated to the outermost air sacs of the lungs at the ends of the bronchial tree. It is thus possible to obtain high local concentrations with varying blood levels via the pulmonary route.

The specific advantages of penicillin over the sulfonamides are as follows: its greater bacteriostatic power against streptococci and staphylococci; the slight effect on its action by the number of bacteria to be inhibited; its bacteriostatic power, which is not inhibited to any appreciable degree by products of tissue autolysis, *p*-aminobenzoic acid or pus, substances that generally annul the bacteriostatic action of the sulfonamides; and its nontoxicity. These advantages suggested to us its superiority as an aerosol in the treatment of serious respiratory disease.

Our earliest observations were made at the time of the Cocoanut Grove disaster in 1942. In 2 patients with inhalational pneumonitis 500 units of penicillin in 1 cc. of distilled water was given at irregular intervals, with the small Vaponefrin nebulizer connected to the oxygen regulator. No accurate conclusions could be derived. Considerably later, when an adequate supply of penicillin could be obtained and proper nebulization equipment had been constructed, we were able to make more progress.

Within the past year, Bryson, Sansome and Laskin[29] working largely with rabbits and normal human beings, demonstrated that penicillin aerosol particles are of sufficient physical stability and of a size favorable for therapeutic use. When inhaled the penicillin aerosol penetrated the lungs, diffused into the blood stream and was excreted in the urine. These authors concluded that a more uniform blood concentration can be maintained by the inhalation method than by intermittent intravenous or intramuscular injections. More recently Barach and his associates[30, 31] have confirmed these observations in rats and in a series of 20 patients with infective bronchial asthma, bronchiectasis and lung abscess. The predominating organisms in the sputum culture were consistently absent for twenty-four hours after discontinuance of treatment. The penicillin blood level one hour following inhalation of the aerosol was generally between 0.01 and 0.04 Oxford units and at times as high as 0.10 units. They employed largely concentrations of 40,000 to 50,000 units per cubic centimer of saline solution. In general, higher levels of penicillin in the blood were obtained after the larger doses. Other factors, such as the subject's breathing pattern, the degree of pulmonary fibrosis and the amount of prevalent expectoration, modified the penicillin blood level. It was further demonstrated that penicillin aerosol protects rats against systemic hemolytic streptococcus infection and that no pathologic irritant effects can be demonstrated in the lungs at postmortem examination.

Olsen[32] described the use of nebulized penicillin preoperatively and postoperatively in a series of 7 patients with surgical bronchiectasis and 8 patients

*From the First and Third Medical Services, Boston City Hospital, and the Department of Medicine, Tufts College Medical School.
†Assistant professor of medicine, Tufts College Medical School; junior visiting physician, Boston City Hospital; junior visiting physician, Beth Israel Hospital.
‡Outpatient physician, Boston City Hospital.

with nonsurgical bronchiectasis. He employed the technic previously described by Barach and his associates. Olsen used the conventional Vaponefrin nebulizer and 2500 units of penicillin per cubic centimeter of solution, alternating a ten-minute period of nebulization with a ten-minute period of rest. Treatment was extended through a ten-hour day, with an average of 75,000 units of penicillin a day. He observed a greater reduction in the amount of sputum by nebulization than by the parenteral

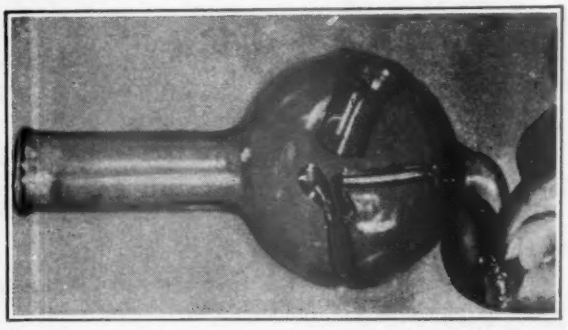

FIGURE 1. *Conventional Vaponefrin Nebulizer.*
This is capable of producing sprays with a particulate size of less than one micron.

route. Furthermore, the sputum became less odoriferous, thinner and less purulent. Olsen concluded that preoperative and postoperative treatment with nebulized penicillin is far superior to treatment with oral or parenteral sulfonamides and appears to be

FIGURE 2. *Nebulizer in Use.*
The nebulizer has been enlarged to one-liter capacity by a rubber bag on top; there is a Y-tube attachment to the oxygen regulator.

the best method to prevent the complications that follow pulmonary resection for suppurative disease.

EQUIPMENT AND TECHNIC

The present report is a preliminary study of the use of aerosolized penicillin solutions in the treatment of patients with pneumonia, bronchiectasis, lung abscess and infective bronchial asthma. In our earliest observations we used the conventional Vaponefrin nebulizer, which produced a fine, voluminous mist or smoke screen with a particulate size of 1 micron or less and capable of penetrating the alveoli. A piece of rubber tubing connected the nebulizer with a regulator attached to an oxygen tank. Oxygen flows of 5 to 7 liters were generally sufficient to aerosolize 1 cc. of the penicillin solution in approximately fifteen minutes. With this technic large amounts of penicillin aerosol escaped during expiration through the top of the carburetor opening. Following suggestions by Barach, the capacity of the Vaponefrin nebulizer (Figs. 1–3) was enlarged to 1 liter to permit condensation and utilization of the expired penicillin. In some cases rebreathing was provided for by the addition of rubber-collecting bags in different positions. To avoid loss of the drug in expiration, a glass Y-tube was placed just proximal to the inlet of the nebulizer. The patient or nurse was instructed to close the open end with one finger

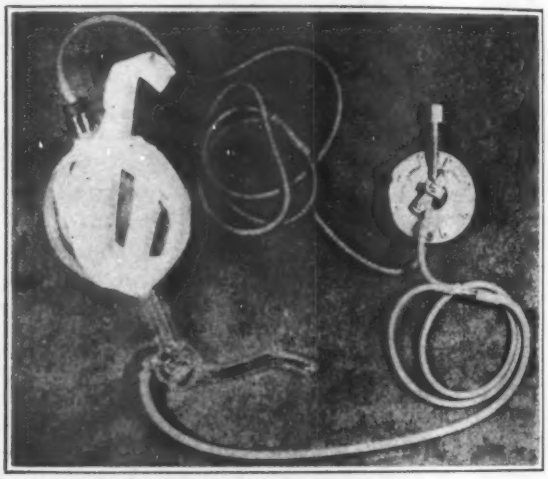

FIGURE 3. *A Closed Rebreathing Arrangement, with an Emerson Demand Valve for Attachment to the Oxygen Regulator. This supplies penicillin aerosol on inspiration only and is most suitable for the sickest patients.*

on inspiration and to remove the finger on expiration. With this technic the oxygen bypassed the nebulizer in the expiratory phase of respiration and no penicillin was lost through the top of the nebulizer. Occasionally an Emerson demand-valve system was attached. This had the advantage of automaticity and did not require the patient's or nurse's co-operation with the Y tube. This was of particular value in the seriously ill patients. Commercial sodium penicillin was used in doses of 15,000 to 30,000 units per cubic centimeter of saline solution given at two-hour or three-hour intervals for three days or longer, depending on the nature of the illness. In the patients with bronchiectasis and lung abscess, postural drainage was performed before each treatment with aerosol.[1] We are continuing to modify the apparatus and the technic of penicillin aerosolization.

A total of 21 patients with pulmonary disease are included in the present series. Many of these had received sulfonamides or penicillin intramuscularly, with no specific benefit, prior to aerosolization therapy. On admission to the hospital, smears and cultures of the sputum, chest plates, routine blood studies and, whenever indicated, bronchoscopies and lipiodol bronchograms were made. As a rule, only cases showing penicillin-susceptible organisms were treated. Penicillin blood levels were generally obtained thirty minutes, one hour and two hours after treatment had been started.

Some were taken immediately and three hours after treatment. The same studies were usually repeated during the course of the illness and prior to discharge. No systemic toxic or allergic manifestations were observed. Some patients at first objected to the smell and taste of the penicillin aerosol or found it irritating to the oropharynx. The nurse generally placed the penicillin saline solution in the nebulizer and turned the oxygen regulator on to a flow of 5 to 7 liters per minute. Many of the patients managed the entire treatment themselves. The pneumonia patients were treated for three or four days; the patients with bronchiectasis or lung abscess, for seven days prior to surgery or for six weeks for purely medical therapy; and those with infective bronchial asthma, for three to ten days.

Results

*Penicillin Blood Levels**

Blood levels for penicillin were obtained in many of the patients and in a series of 6 controls (Tables 1 and 2). Urine levels were not obtained owing to technical difficulties.

Absorption of penicillin from the pulmonary tree into the blood stream was demonstrated by the effective penicillin blood levels, which ranged from 0.028 to 0.223 units per cubic centimeter. Many of the controls, who were free of lung disease, gave zero levels. Generally speaking, higher blood levels were obtained in those with extensive lung involvement of a pyogenic type — that is, those with pneumonia or lung abscess. A single striking ex-

Table 1. *Penicillin Blood Levels of Patients with Respiratory Disease.*

Patient's Name	Diagnosis	Date	Penicillin Blood Level	
			Time after treatment	Level
				units/cc.
M. D.	Infective bronchial asthma	4/27/45 and 4/30/45	30 min. 1 hr. 2 hr.	0.028 0.028 0.000
T. H.	Chronic bronchitis; pulmonary fibrosis; possible bronchial asthma.	8/ 1/45	30 min. 1 hr. 2 hr.	0.000 0.000 0.000
O. M. (Case 1)	Pneumonia of left lower lobe (Type 14)	12/30/44	Immediately 20 min. 45 min. 1 hr., 45 min.	0.055 0.055 0.110 0.055
E. R. (Case 2)	Pneumonia of left lower lobe (Type 12)	12/30/44	15 min. 35 min. 55 min. 2 hr.	0.055 0.028 0.055 0.000
A. P. (Case 3)	Pneumonia of left lower lobe (Type 33)	5/16/45	30 min. 1 hr. 2 hr.	0.055 0.028 0.000
M. F. (Case 4)	Pneumonia of left lower lobe (Type 1)	5/18/45	30 min. 1 hr. 2 hr.	0.055 0.028 0.028
V. R. (Case 5)	Pneumonia of right upper lobe (Type 1)	5/17/45	30 min. 1 hr. 2 hr.	0.000 0.000 0.000
M. G. (Case 6)	Pneumonitis of left lower lobe; infarct; atelectasis.	5/ 5/45	30 min. 1 hr. 2 hr.	0.028 0.000 0.000
G. R.	Bronchiectasis (left lower lobe)	4/ 4/45	30 min. 2 hr. 2 hr.	0.028 0.000 0.000
C. V.	Chronic bronchitis; bronchiectasis; bronchopneumonia.	8/ 8/45	30 min. 1 hr. 2 hr.	0.028 0.020 0.000
M. R.	Chronic bronchitis; bronchiectasis.	8/21/45	30 min. 1 hr. 2 hr.	0.055 0.028 0.028
J. G. (Case 8)	Lung abscess (right upper lobe)	3/31/45	1 hr.	0.028
W. McD. (Case 9)	Lung abscess (left upper lobe)	4/17/45 4/21/45 5/ 3/45 5/ 9/45 5/10/45	30 min. 1 hr. 2 hr. 30 min. 1 hr. 1 hr., 10 min. 1 hr. 3 hr.	0.220 0.220 0.110 0.110 0.110 0.000 0.000 0.000

*These levels were determined by Dr. Maxwell Finland and his associates at the Thorndike Memorial Laboratory, Boston City Hospital.

ception was a patient (Case 5) with Type 1 pneumonia involving two lobes. It was impossible on two occasions to obtain a penicillin blood level, but the clinical response was nevertheless most striking,

Bacterial Pneumonia

A course of penicillin aerosol lasting for three to seven days was given to 5 patients with bacterial pneumonia and to 1 patient with pulmonary in-

TABLE 2. *Penicillin Blood Levels of Controls.*

SUBJECT'S NAME	DIAGNOSIS	DATE	PENICILLIN BLOOD LEVEL	
			TIME AFTER TREATMENT	LEVEL units/cc.
J. McL.	No disease	4/27/45	30 min.	0.028
			1 hr.	0.000
			2 hr.	0.000
		5/ 9/45	30 min.	0.055
			1 hr.	0.028
			2 hr.	0.000
		5/16/45	30 min.	0.028
			1 hr.	0.000
			2 hr.	0.000
M. S. S.	No disease	5/ 9/45	30 min.	0.000
			1 hr.	0.000
			2 hr.	0.000
		5/11/45	30 min.	0.000
			1 hr.	0.000
			1 hr., 45 min.	0.000
		5/18/45	30 min.	0.028
			1 hr.	0.000
M. B.	Cardiac decompensation	6/ 5/45	30 min.	0.000
			1 hr.	0.000
			2 hr.	0.000
A. P.	Cardiac decompensation; bronchopneumonia.	6/ 5/45	30 min.	0.028
			1 hr.	0.028
			2 hr.	0.028
W. W.	Acute sinusitis	6/ 7/45	30 min.	0.000
			1 hr.	0.000
			2 hr.	0.000
D. L.	Pernicious anemia	6/ 7/45	30 min.	0.000
			1 hr.	0.000
			2 hr.	0.000

and there can be no question of the topical effectiveness of the treatment in this case.

We believe that the absorption of penicillin into the blood is not necessarily a measure of the topical effectiveness of penicillin aerosol. The blood levels vary according to the subject's breathing pattern, the equipment used, the dosage and type of penicillin used, the variations of absorption of accumulated pus and secretions and the technic for determining the penicillin levels. Obtaining blood levels is more of academic interest than of practical value. The clinical course is sufficient proof of the topical effectiveness of penicillin aerosol, as is best demonstrated in the patients with pneumonia.

Infective Bronchial Asthma

A course of penicillin aerosol lasting for three to nine days was given to 6 patients with severe chronic infective bronchial asthma. The penicillin-susceptible organisms promptly disappeared and in most cases remained absent during hospitalization. The course of the underlying bronchospasm was not strikingly influenced, and measures employing the principles of repeated bronchiolar relaxation were more effective for its relief. Allergic reactions to penicillin aerosol have been reported,[29, 31] but were not observed in any of our patients. The possibility of further sensitization in patients with allergic vasomotor rhinitis and bronchial asthma must be appreciated.

farction and pneumonitis. The response was striking. In most cases the clinical charts returned to normal promptly, the patient felt well throughout

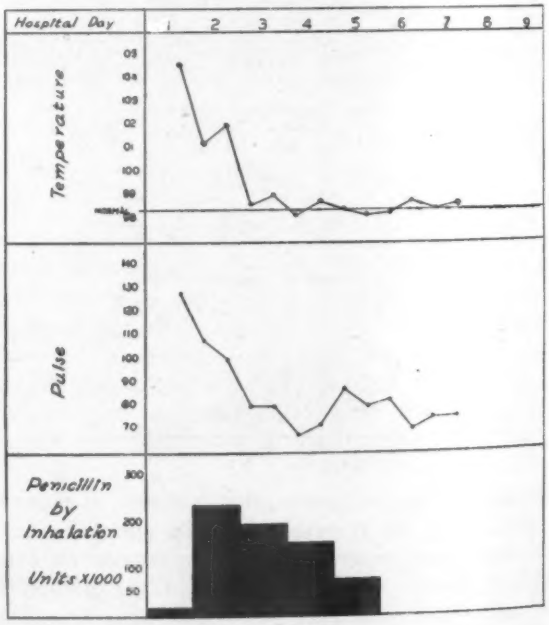

FIGURE 4. *Case 1.*

treatment, and no complications were encountered. The sputum became negative on the second or third day and remained so at the time of discharge, after

six to ten days of hospitalization. Brief abstracts of these cases follow.

Case 1. O. M., a 34-year-old housewife, entered the hospital because of the sudden onset of shaking chills and fever 14 hours previously. Following this, she developed precordial pain and cough. On admission another chill occurred. Physical examination on admission revealed an acutely ill woman breathing with grunting respirations. The only other positive findings were in the chest, where at the left base the breath sounds were decreased and a few rales were heard. The white-cell count was 20,000, with 90 per cent neutrophils and 10 per cent lymphocytes. X-ray examination of the chest revealed faint cloudiness at the left base. The sputum on direct Neufeld examination was found to contain a Type 14 pneumococcus. The patient was given symptomatic treatment and started on penicillin by inhalation — 20,000 units every 2 hours for nineteen doses and every 3 hours for sixteen doses, a total of 700,000 units. The cough and sputum decreased within 24 hours after the commencement of treatment, and the temperature was normal at the end of 48 hours. Although the lungs never showed frank consolidation, the lung fields were clear and the sputum culture was negative at discharge on the 10th hospital day.

For the penicillin blood levels, see Table 1.

Case 2. E. R., a 26-year-old woman, entered the hospital with a history of gradual onset of a "head cold," sore throat, fever and malaise 1 week previously. Twenty-four hours before admission she experienced a severe shaking chill, pain in the left chest and a cough productive of blood-streaked sputum. On physical examination, the pharynx was injected and at the left base were found dullness, diminished tactile fremitus and distant bronchial breath sounds. The white-cell count was 31,000, with 90 per cent neutrophils and 10 per cent lymphocytes. X-ray examination of the chest revealed lobar pneumonia of the left lower lobe. On mouse inoculation,

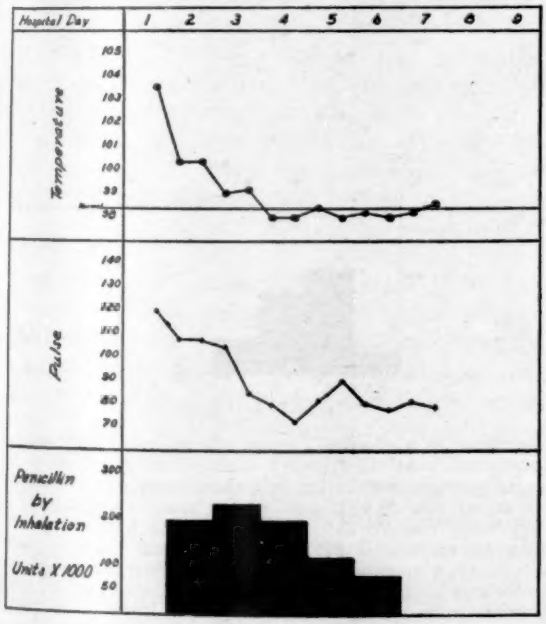

Figure 5. *Case 2.*

the sputum was found to contain a Type 12 pneumococcus. The patient was given 20,000 units of penicillin by inhalation every 2 hours for twenty-six doses and then every 3 hours for sixteen doses, a total of 840,000 units. By the end of the 1st hospital day, the temperature and pulse began to fall. On the next day they were still lower and the physical signs were less intense. On the 3rd day, a pleural friction rub was heard in the left axilla. By the 6th day, the sputum was negative on culture and the lungs were clear. The patient was discharged on the 8th day.

For the penicillin blood levels, see Table 1.

Case 3. A. P., a 16-year-old schoolgirl, entered the hospital because of the sudden onset of chilly sensations, fever and pain of a pleuritic nature in the right anterior portion of the chest 12 hours previously. Three weeks before admission she had a "cold," with coryza, sore throat and cough. Physical examination revealed a toxic, flushed young girl in acute distress. At the base of the left lung there was a slight increase in tactile fremitus and also in breath sounds. The white-cell count was 14,750, with 90 per cent neutrophils, 76 per cent being mature and 14 per cent band forms, 8 per cent lymphocytes and 2 per cent monocytes. X-ray examination showed a typical pneumonia of the left lower lobe. Culture of the sputum revealed a Type 33 pneumococcus. Adequate hydra-

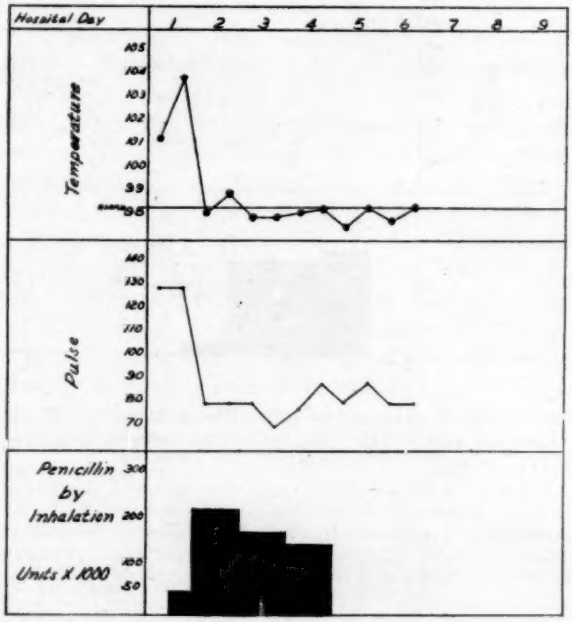

Figure 6. *Case 3.*

tion was given, despite which the temperature rose from 101.4 to 104°F. Penicillin by inhalation was then started — 25,000 units every 2 hours for six doses and then 25,000 units every three hours for eighteen doses, a total of 600,000 units. Following the institution of this treatment, the temperature dropped dramatically to normal within 8 hours, staying essentially normal for the rest of the hospital stay. On the 2nd hospital day, physical examination revealed slight dullness and a few rales at the base of the left lung. The lung fields were clear and the sputum was negative on discharge on the 6th day.

For the penicillin blood levels, see Table 1.

Case 4. M. F., a 24-year-old housewife, entered the hospital complaining of a severe "bronchitis" with a heavy cough and sputum for 7 weeks previously. Twelve hours previous to admission, she noticed the sudden onset of chills, fever and sharp pain in the left chest and observed that the sputum had become blood-streaked. On physical examination, the patient was found to be dyspneic and in obvious distress because of pain, which she attempted to alleviate by splinting the left chest. There was diminished expansion, impaired resonance and egophony in the left axilla. The white-cell count was 20,600, with 82 per cent neutrophils, 70 per cent being adult and 12 per cent band forms, 14 per cent lymphocytes and 4 per cent monocytes. X-ray examination showed pneumonia of the left lower lobe, and culture of the sputum was positive for a Type 1 pneumococcus. Penicillin was given by inhalation — 25,000 units every 2 hours for six doses and then every 3 hours for eighteen doses, a total of 600,000 units. No frank consolidation ever developed, but on the 3rd day a few coarse rales and wheezes were heard

in the left axilla. The temperature reached normal within 8 hours after the beginning of treatment, and remained there

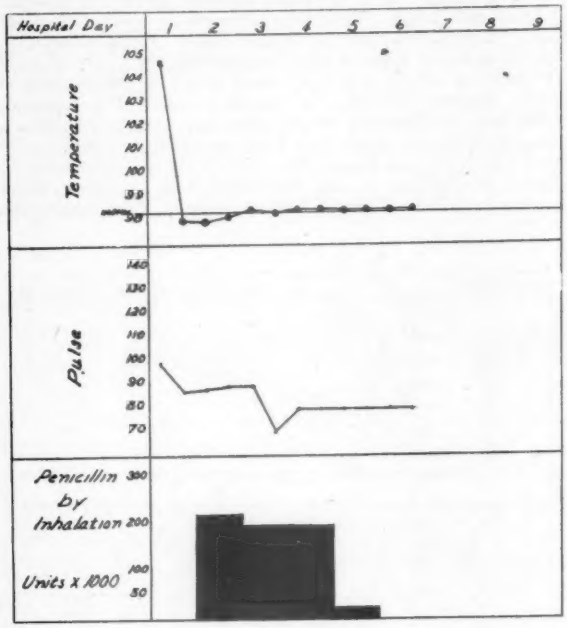

FIGURE 7. *Case 4.*

for the rest of the hospital stay. The sputum was negative on the 3rd day, and the lung fields were clear on the 5th day.

For the penicillin blood levels, see Table 1.

CASE 5. V. R., a 39-year-old man, entered the hospital because of the acute onset of dry cough and vomiting 4 days previously. On the day of admission, the cough became productive and he complained of feverishness and epigastric pain. His physician had given him approximately 5 gm. of

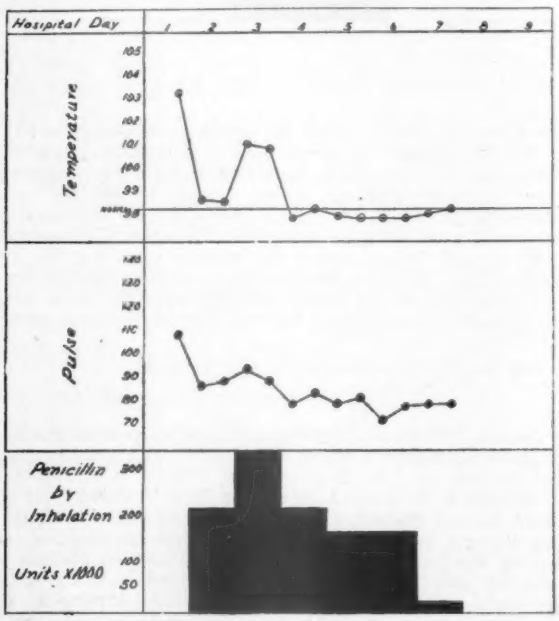

FIGURE 8. *Case 5.*

some sulfonamide, but showing no improvement under this therapy, he entered the hospital. On admission the patient was cyanotic, dyspneic and toxic. Physical examination showed decreased breath sounds and a few moist rales in the right axilla. The white-cell count was 20,250, with 87 per cent neutrophils, 79 per cent being mature and 8 per cent band forms, 12 per cent lymphocytes and 1 per cent basophils. X-ray examination showed clearing pneumonia of the left lower lobe and pneumonia of the right upper lobe. Culture of the sputum revealed a Type 1 pneumococcus before treatment, was negative for pneumococci 5 hours after the beginning of treatment and showed the growth of no organisms 2 days after the start of treatment. The patient was started on penicillin by inhalation — 25,000 units every 2 hours for seven doses, to be followed by 25,000 units every 3 hours. The temperature dropped to normal 8 hours after the commencement of treatment, but rose to 101°F. on the 2nd hospital day. It was discovered that technical difficulties had developed, so that the patient received no penicillin for 10 hours. Resumption of the treatment was carried out with 50,000 units every 2 hours for six doses, 25,000 units every 2 hours for five doses and finally 25,000 units every 3 hours for nineteen doses, a total of 1,075,000 units. As soon as treatment was resumed, the temperature dropped to normal and remained there. On the 5th day, the lung fields were clear and the cough and sputum were less.

The penicillin blood level was zero 30 minutes, 1 hour and 2 hours after treatment (Table 1).

CASE 6. M. G., a 68-year-old woman, entered the hospital because of the sudden onset of sharp pain in the left chest, aggravated by coughing, deep breathing and motion, 14 hours previously. She later developed a high fever and a slight dry cough. On physical examination, the only positive find-

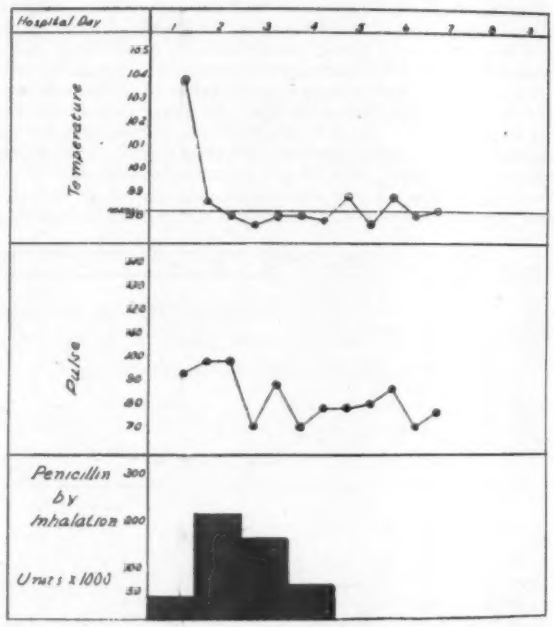

FIGURE 9. *Case 6.*

ings were in the chest, where there was slight dullness, diminished vocal and breath sounds and a few moist rales on deep inspiration in the left chest anteriorly. The white-cell count was 26,450, with 92 per cent neutrophils, 87 per cent being mature and 5 per cent band forms, 7 per cent lymphocytes and 1 per cent monocytes. X-ray examination showed pneumonia of the left lower lobe, with plate atelectasis at the left base. No pneumococci were ever recovered from the sputum or throat cultures. The patient was started on inhalation of penicillin — 25,000 units every 2 hours for six doses and then every 3 hours for fifteen doses, a total of 525,000 units. The temperature dropped dramatically from 104 to 99°F. by the end of the 1st hospital day. Pleuritic pain continued for several days. The lung fields were clear on the 10th hospital day.

For the penicillin blood levels, see Table 1.

These cases of bacterial pneumonia are, it is believed, the first to be treated with penicillin aerosol. At the outset it was hoped to show the topical bacterial effectiveness of penicillin aerosol on the or-

ganisms in the bronchial mucosa and alveoli. This was consistently demonstrated in the pneumonia patients. Absorption of penicillin from the pulmonary tree into the blood stream was demonstrated by the effective blood levels, which ranged from 0.028 to 0.055 units per cubic centimeter. In a recent report by Meads, Harris and Finland,[33] the minimum inhibiting concentration of penicillin was 0.016 units per cubic centimeter for twenty-seven pneumococcal strains and 0.032 units for nine pneumococcal strains. Levels of 0.032 units inhibited the growth of all but two strains of pneumococcus. Barach and his associates[31] have pointed out, however, that the absorption of penicillin into the blood and its recovery from the urine are not necessarily measures of the effectiveness of penicillin aerosol. We have come to the same conclusion, and this is strikingly illustrated by the course of the disease in Case 5, which has already been referred to.

We do not advocate the general use of penicillin aerosol for the treatment of pneumococcal pneumonia. The sulfonamides and more recently oral and parenteral penicillin have proved most effective and easier to administer. Purulent complications did not develop in a series of 54 severe cases of pneumococcal pneumonias reported by Meads, Harris and Finland.[33] On the other hand, they attributed the failure of some established purulent complications to clear following parenteral penicillin to its inability to penetrate the infected foci in adequate amounts. Penicillin aerosol may prevent or improve such complications by its topical effectiveness. We are continuing our studies in this direction and hope to find more patients with streptococcal or staphylococcal pneumonia, for these are the ones who can be specifically helped.

Bronchiectasis

A course of penicillin aerosol lasting for one to six weeks was given to 5 patients with bronchiectasis. Immediate defervescence, lessening of toxicity, diminution in the amount of daily sputum, loss of foul character of the sputum and rapid disappearance of penicillin-susceptible organisms were observed in all these patients.

Oral or parenteral treatment of patients with bronchiectasis and lung abscess with sulfonamides has been of little value. The bronchoscopic instillation of sulfonamides and aerosolized solutions of sulfonamides in pulmonary suppurative disease has proved more effective.

The value of parenteral penicillin in suppurative pulmonary disease has been largely limited to the prevention of systemic infections. Stookey and his associates[34] observed little or no improvement in patients with true bronchiectasis, but noted improvement in 20 per cent of a group of patients with chronic bronchitis. Cough and morning sputum disappeared after the fourth day of treatment in the favorable cases, but in most cases the volume of sputum was not reduced. Colonies of hemolytic streptococci and staphylococci in sputums were decreased. White and his associates,[35] on the other hand, demonstrated the value of preoperative and postoperative intramuscular penicillin in a series of 21 cases of pulmonary suppuration. Penicillin was given for one week before operation and for two weeks after it. There were no complicating empyemas. In a series of 20 cases no penicillin was given, and empyema developed postoperatively in 12. These observations further stimulated our interest in penicillin aerosol.

The anatomic changes accompanying bronchiectasis are permanent ones, and probably cannot be changed by any therapy save resection. Such patients are subject to repeated episodes of infection, pneumonitis or involvement of other lobes. The mucosal secretions in bronchiectasis largely result from the structural changes in the endothelial lining of the smaller bronchioles. Invasive organisms contribute by further destruction of these bronchioles. Infection can be reduced or eliminated by penicillin aerosol. It thus becomes the ideal therapy for preoperative and postoperative bronchiectasis. The foul sputum can generally be eradicated. The secretions become thinner and less copious, the troublesome cough disappears, and the patient's general condition at operation is remarkably better. Postoperatively the penicillin can be given intramuscularly if the patient is too sick for aerosol therapy. From our observations in 2 cases of surgical bronchiectasis, we suggest a course of one to three weeks preoperatively and one week postoperatively, employing the technic described above.

The question arises concerning what can be done for patients with bronchiectasis who refuse surgery and for those for whom resection is not advisable. These make up a large group, with involvement of one or more lobes. Our own observations are too limited for any conclusions but a certain pattern presents itself.

Three patients had bronchiectasis of the left lower lobe, proved by lipiodol bronchograms; two had had their disease for over five years and the third for one year. The 2 former patients had had recurrent episodes of pneumonitis, necessitating repeated hospitalization. Both received a seven-day course of penicillin aerosol, with complete subsidence of symptoms and disappearance of organisms. They have remained relatively free of all symptoms and have been able to work without loss of time for nine and twelve months, respectively. Previously they had received therapeutic and prophylactic sulfonamides, with only short-lasting effect. These are the longest periods of freedom from symptoms and recurrence of pneumonitis that they have been able to enjoy. Unfortunately, they refused recheck lipiodol bronchograms, which would have been of considerable interest. The third patient, a twenty-six-year-old man, had been discharged from military

service because of bronchiectasis of the left lower lobe, acquired following exposure and severe respiratory infections. He also had pansinusitis with polyposis. He was given a seven-day course of penicillin aerosol, soon became symptom-free and subsequently received the proper surgical care for the polyps. A repeat lipiodol bronchogram again revealed bronchiectasis in the left lower lobe. The patient has remained symptom-free and has been able to perform his regular work for the last four months. Another and longer course of penicillin aerosol, directed nasally as well as to the lungs, will be given six months after the first course.

These 3 patients are most pleased with the results thus far obtained. Their vital capacities have increased from 30 to 40 per cent above the pre-aerosol level and have remained fairly constant at the improved figure. Each patient has been urged to have a lobectomy performed and has refused. All three have been advised that they will ultimately probably require lobectomy and that penicillin aerosol may serve temporarily by sterilizing the "stagnant cesspool."

No untoward results of penicillin aerosol have been seen. Many patients with bronchiectasis probably require repeat courses at three-month or six-month intervals. Penicillin is now within everyone's reach, and the therapy can be easily carried out in the patient's home. The more resistive cases will undoubtedly require therapeutic courses up to six weeks or longer. Those with sinus involvement will require penicillin aerosol by the nasal route and possibly subsequent sinus surgery. Studies along this line are being made for a subsequent report.

Lung Abscess

A course of penicillin aerosol was given to 4 patients with lung abscess. Reports of these cases follow.

CASE 7. L. S., a 38-year-old man, developed an acute, fulminating, putrid lung abscess with cavitation following tonsillectomy. He was desperately ill on admission, with a temperature of 104°F. A chest plate revealed a large lung abscess with a cavity measuring 8 by 8 cm., together with a fluid level. There was a hacking cough productive of foul, dark sputum containing lung tissue. Sputum culture revealed Friedländer's organisms, streptococci, staphylococci, fusiform organisms and many others. The patient was given a 4-day course of penicillin aerosol, without any clinical improvement except in the foul odor of the sputum and breath. Following a rib resection and drainage on the 5th hospital day, he expired suddenly 4 hours postoperatively.

CASE 8. J. G., a 50-year-old man, was admitted complaining of a cough productive of foul sputum of 1 year's duration. He had been operated on 5 years previously for an abscess in the right upper lobe. The sputum on admission was yellowish, thick and foul-smelling. Culture revealed an alpha-hemolytic streptococcus, diphtheroids and *Neisseria flavis*. Chest plates showed an extensive abscess in the right upper lobe, with bronchiectasis. During a seven-day course of penicillin aerosol, the sputum became less productive and more watery. A sputum culture at the end of therapy revealed no streptococci, although the diphtheroids and *N. flavis* survived. The foul odor of the sputum soon disappeared, the patient felt better, and the appetite improved. A right pneumonectomy was performed on the 8th day; no growth was obtained from the chest fluid postoperatively. During convalescence penicillin was given intramuscularly and the patient made an uneventful recovery.

CASE 9. W. McD., a 59-year-old man, entered the hospital with a history of a "head cold" 6 months previously, followed by a cough productive of light-yellow sputum. This was accompanied by fever and chilliness. Two months later he caught another cold, which persisted. This was accompanied by a chronic cough productive of dark-brown and foul-tasting sputum, which interfered with his sleep. The sputum was at first small in amount, but gradually increased up to 500 cc. a day, more being raised in the morning than at night. On three occasions there were small hemoptyses. There were anorexia, fatigue and a weight loss of 20 pounds. One week before entry darting sharp pains began through the left shoulder, radiating to the anterior chest and lasting for a few seconds.The nails became slightly clubbed during this illness. A chest plate on admission (Fig. 10) revealed a lemon-sized lung abscess with a fluid level in the left upper lung field and slight mottling about the abscess, due to pneumonic changes. Bronchoscopy revealed no endobronchial tumor. On the 1st hospital day, the patient raised 500 cc. of moderately foul sputum containing alpha hemolytic streptococci, *N. catarrhalis*, diphtheroids and *Haemophilus hemolyticus*. He was placed on bed rest, postural drainage and oral sulfadiazine. Maximum sulfadiazine levels of 9.3 to 14.1 mg. per 100 cc. were maintained. This program cleared up the low-grade fever but did not otherwise alter the clinical course. On the 10th day, the patient was still raising 500 cc. of sputum with the same physical and bacteriologic characteristics of the initial sputum. The chest plate revealed a more definite pneumonitis surrounding the large lung abscess. On the 11th day, a course of penicillin aerosol, 30,000 units per cubic centimeter of saline solution every 3 hours, day and night, was begun. Extremely effective penicillin blood levels were obtained as follows: 30 minutes after aerosol, 0.220 units; 1 hour after aerosol, 0.220 units; 2 hours after aerosol, 0.110 units; and 3 hours after aerosol, 0 units. The patient was very co-operative, and within 4 days the appetite improved and the cough lessened. Within 10 days of the commencement of penicillin aerosol, the sputum was no longer foul-tasting and had decreased from 500 to 250 cc. a day. The cough practically disappeared and the appetite was normal. By the 18th day, the patient was raising only about 50 cc. of sputum and felt "wonderful." At the end of 42 days of treatment, he had only a slight cough, productive of less than 15 cc. of sputum daily, and had fully regained his normal strength and weight. Sputum cultures shortly after onset of treatment revealed only an atypical Friedländer bacillus and *Escherichia coli*. Serial x-ray studies showed a striking progressive improvement, with resolution and ultimate fibrosis of the entire process. The patient was discharged after 8 weeks of hospitalization, and subsequent clinical and x-ray checkups revealed a complete cure.

CASE 10. L. C., a 54-year-old graduate nurse, was struck by an automobile, receiving fractures of the left humerus and the 8th rib on the right. She was hospitalized and the fractures were treated. On the 10th hospital day, signs and symptoms of pneumonia of the right lower lobe appeared and sulfadiazine was begun. Because of a poor response, this treatment was changed to penicillin intramuscularly, 15,000 units every 4 hours. One week later the patient complained of pain in the right leg, and a diagnosis of phlebothrombosis was made. Vein ligation was advised, but was not carried out because of the patient's condition. The pneumonia cleared slowly, but an accumulation of fluid was found in the right chest. This was tapped and 650 cc. of reddish-brown fluid was removed. A culture showed no growth. Sulfadiazine and penicillin were again given, and within 1 week x-ray and physical signs showed the lung fields to be clear. On the 39th day, severe precordial pain suddenly began, with sweating, cyanosis, dyspnea and apprehension. Coronary-artery disease was suspected. Following this, similar episodes of chest pain continued, and the possibility of multiple pulmonary infarcts arose. On the 52nd day, following one of these episodes, the temperature again became elevated, and sulfadiazine was resumed. A cough productive of purulent sputum soon developed, and a chest plate revealed an abscess of the left upper lobe. Ten days later the patient

was started on intramuscular penicillin, 15,000 units every 3 hours, and on penicillin aerosol, 25,000 units every 3 hours. The intramuscular penicillin was gradually reduced, but the penicillin aerosol was continued in full doses. Within 1 week x-ray films showed marked improvement in the lung disease, and after 16 days penicillin aerosol was discontinued. Shortly thereafter x-ray films showed normal lung fields and the patient was much improved. She was discharged after 3 months of hospitalization to convalesce from her fractures.

From our observations it appears that penicillin aerosol should be employed in all cases of multiple lung abscess for courses as long as four to ten weeks. After a suitable rest period another course may be given if necessary. In patients with acute or chronic lung abscess of the odoriferous, anaerobic type, penicillin aerosol is likely to prove of no curative value but is of possible preoperative benefit. In the nonodoriferous, aerobic type, our experience with the single case described was most unusual. It appears to be a physiologically sound conclusion that the postpneumonic, aerobic, nonodoriferous lung abscess may best lend itself anatomically to topical aerosol therapy, in contrast to the odoriferous type. It may be possible to avoid surgery in these cases with an effective program of penicillin aerosol. In most cases we have not employed intramuscular penicillin along with penicillin aerosol.

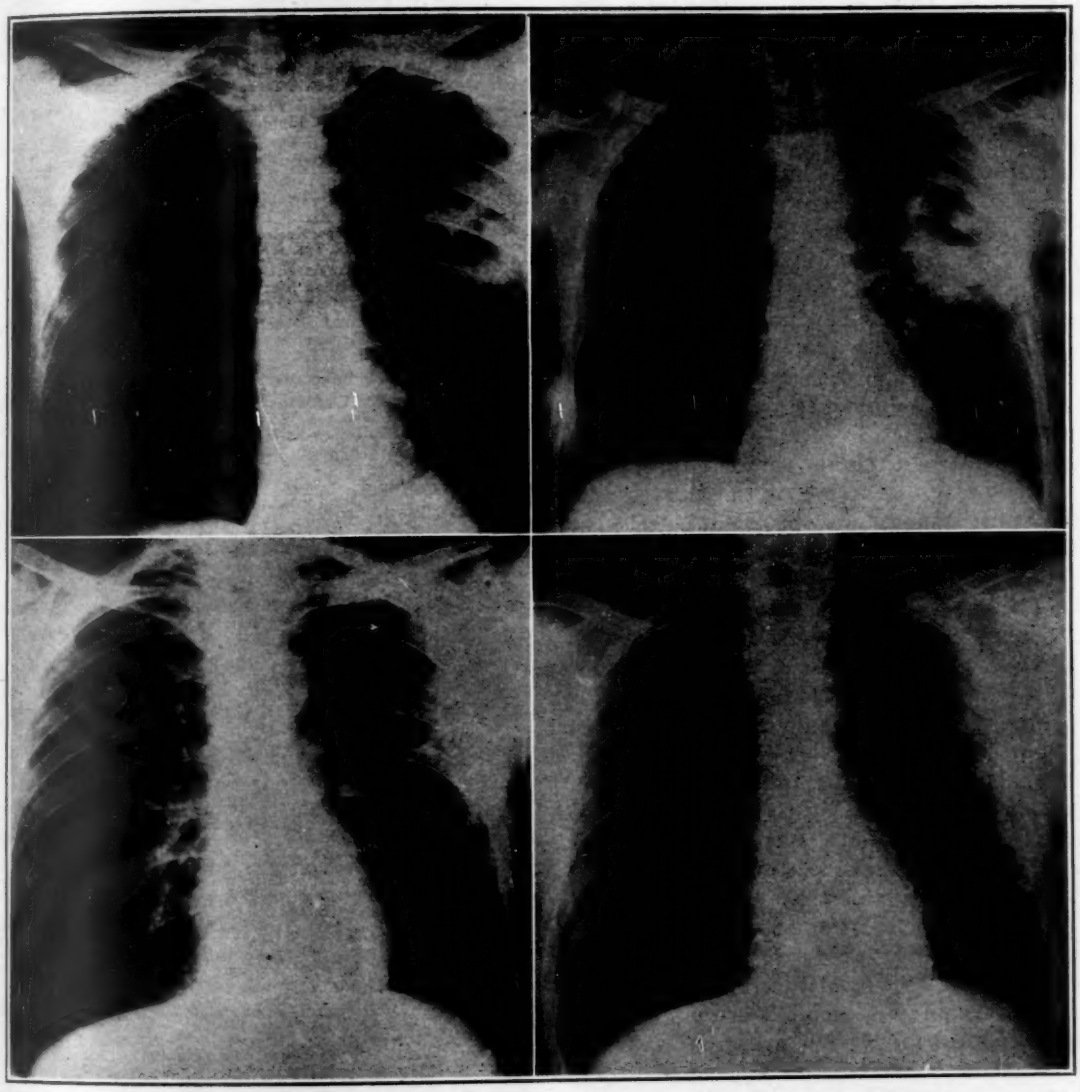

FIGURE 10. *Roentgenogram of Chest in Case 9.*

A — This film was taken on admission; there is a lemon-sized lung abscess in the left upper lobe, with irregular cavitation, a fluid level and pneumonitis. B — This film was taken after five days of penicillin aerosol therapy; there is an increased area of density in the midouter zone. C — This film was taken after one month of aerosol therapy; there is evidence of pneumonitis and fibrosis in the left upper lobe, but no fluid level. D — This film was taken two months after stopping aerosol therapy; the patient was symptom free and had gained 25 pounds in weight, recovery being considered complete.

Summary and Conclusions

Penicillin aerosolization was employed in 21 patients with serious respiratory disease.

The clinical course of 6 patients with infective bronchial asthma was not altered, although the penicillin-susceptible organisms were eradicated.

Striking clinical cures were promptly obtained in 5 patients with pneumococcal pneumonia and in 1 patient with an acute pulmonary infarction and pneumonitis. Penicillin blood levels of 0.028 to 0.055 Oxford units per cubic centimeter were obtained in 5 patients. In a patient with Type 1 lobar pneumonia the level was not detectable. Observations in this series definitely proved the bacterial effectiveness of topical penicillin aerosol in pulmonary disease.

Five patients with bronchiectasis were successfully treated, 2 patients before lobectomy and the other 3 entirely medically. Defervescence, lessening of toxicity, diminution in the amount of daily sputum, loss of foul character in the sputum, rapid disappearance of penicillin-susceptible organisms, improvement in appetite and a gain in weight were uniformly observed. Such therapy is believed to be more helpful than sulfonamides or penicillin parenterally.

Four patients with lung abscess were treated with penicillin aerosol. One of them, with a fulminating putrid lung abscess, died on the fifth hospital day following surgery. Another, with a chronic putrid lung abscess, was adequately prepared for an uneventful lobectomy. The third patient, with a large, nonodoriferous, aerobic type of lung abscess, with a fluid level, was entirely cured after six weeks of therapy. The fourth patient, with multiple lung infarcts and a lung abscess, improved slowly but completely. Penicillin aerosolization has a definite value in the treatment of patients with serious respiratory disease. Effective local medication with adequate systemic blood levels for most of the penicillin-susceptible organisms can be obtained. Systemic blood and urine levels, however, are merely an indication of absorption through the lung and are not necessary to prove topical effectiveness. No toxic results were observed in this series. The technical difficulties have been overcome. Procedures for various age groups with different breathing patterns can be arranged. It is hoped that other antibiotic agents, when available and if nontoxic, may prove of some value in the form of an aerosol in similar cases.

370 Commonwealth Avenue

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CLINICAL AND LABORATORY STUDIES OF NINETY-ONE WORKERS WITH APICAL SYSTOLIC MURMURS

CAPTAIN IRVING NORMAN WOLFSON, M.C., A.U.S.

THE attitude of the medical profession toward systolic murmurs of the heart has been one of great inconsistency. In former years, many physicians thought that the presence of such a murmur was indicative of heart disease. The opposite attitude is expressed in the frequently quoted statement of Mackenzie that the physician would do well to throw away his stethoscope while evaluating cardiac murmurs. In an attempt to investigate the significance of apical systolic murmurs, 91 workers with this lesion were studied clinically, as well as with x-ray films and electrocardiograms. The results are reported below.

The solution of this problem is important today for two reasons. In selecting men for the armed services, it is important to know whether the hearts of persons with systolic murmurs that cause no symptoms of failure in civilian life can continue to function normally under the increased demands of military service. If the systolic murmur is an indication of heart disease, it would be more economical to reject such men at the induction centers rather than to have an appreciable number of them break down after the expenditure of time and money in training. The scope of the problem is shown by the fact that of all men examined for induction, 1.59 per cent are found to have rheumatic or valvular heart disease and are usually rejected. At the same time, 0.53 per cent have murmurs considered to be functional and are accepted.[1] A survey of 45,000 candidates for air training disclosed the presence of valvular disease in 100.[2]

Even if the finding of a systolic murmur is not indicative of any potential impairment of cardiac function, another distinct problem arises. There has been an increase in the use of prophylactic measures against subacute bacterial endocarditis in the form of sulfonamide administration before performing minor infective surgical procedures on patients with valvular lesions. One must therefore decide whether patients with systolic murmurs have diseased valves that are more susceptible than are normal valves to infection with the usual causative organisms. If this should be the case, it would be justifiable to use prophylactic sulfonamide medication before removing the teeth or tonsils. Furthermore, if the chemoprophylaxis of rheumatic-fever recurrences by the administration of constant small doses of sulfonamides during the winter months becomes widespread, it will be necessary to decide how many patients with systolic murmurs and negative past histories have actually had subclinical attacks of rheumatic fever that produced the murmur.

REVIEW OF THE LITERATURE

A prominent reason for the present inconsistent attitude toward systolic murmurs is the frequency with which these are encountered in apparently normal subjects. Thus, Thayer[3] found that over one third of 218 seemingly healthy persons in the first four decades of life had apical systolic murmurs in the recumbent position. Freeman and Levine[4] discovered apical and basal systolic murmurs in one fifth of 1000 subjects.

Evidence of the unimportance of systolic murmurs is afforded by Blumenthal,[5] who followed 100 patients with this lesion for an average period of seven years. During this time, only 4 patients developed other cardiac abnormalities. Contratto[6] reported on 127 Harvard students with apical or basal systolic murmurs the significance of which was uncertain after initial examinations. After a follow-up lasting two to three years, he was unable to make a diagnosis of organic valvular disease in any case, and several of the patients took part in football and other athletics during their college careers.

Strong evidence that systolic murmurs are of prognostic significance may be obtained from insurance figures quoted by McCrudden.[7] Having analyzed the independent and concordant findings of three insurance companies, this writer points out that patients with systolic murmurs have a mortality due to heart disease as much as seven to ten times greater than expected. Furthermore, this mortality is increased when the murmur is accompanied by cardiac hypertrophy or a history of rheumatic fever. A separate study revealed that deaths in patients with murmurs considered functional occurred with four times the frequency expected.

White[8] reported on 1000 patients with apical systolic murmurs, including some with accompanying diastolic murmurs. Although stating that slight apical systolic murmurs are frequent and are in themselves of little or no importance in the absence of other signs of heart trouble, he found that only 19 per cent of the patients had normal hearts and that in 6 per cent normalcy was doubtful. The rest of the patients had organic heart disease. Furthermore, the incidence of organic heart disease increased with the intensity of the systolic murmur, ranging from 56 per cent in patients with slight murmurs to 98 per cent in those with loud ones. Similar findings are reported by Freeman and

Levine,[4] who found that every one of 19 patients with apical and basal murmurs of intermediate intensity had disease that adequately explained the presence of the murmurs, whereas of 196 patients with fainter murmurs 45 had no evidence of disturbed cardiovascular function. The radiographic and electrocardiographic findings in these 45 patients were not, however, mentioned. These authors concluded that many systolic murmurs that are regarded as functional are in fact organic in the sense that there is a structural change in the valves causing the murmur.

Fineberg and Steuer[9] followed 100 children with loud apical systolic murmurs for six years. Sixty per cent of them still had the murmurs after this period; 30 per cent had developed signs of additional valvular lesions; and in 8 per cent the murmur had disappeared. There were 2 deaths, including one from subacute bacterial endocarditis. The incidence of development of frank valvular disease was higher in the patients with a history of rheumatic fever or chorea, as well as in those with clinical or roentgenologic evidence of enlargement of the heart.

Rednick[10] has attacked the problem from the pathological viewpoint. He studied the autopsy reports of 268 patients with systolic murmurs — including 33 who also had diastolic murmurs — obtained from examining over a thousand consecutive protocols. In only 4 per cent of these cases was there no clinical or pathologic explanation for the murmur. In 18 per cent in which the heart showed no pathologic changes, there was present a clinical explanation for the murmur, such as hypertension, anemia or tachycardia. The remainder of the cases (78 per cent) showed pathologic lesions that could have been responsible for the murmurs. The last group may be divided into two. Forty-four cases (16 per cent of the total) showed evidence of valvular stenosis or insufficiency. One hundred and thirty-six cases (51 per cent) had minor abnormalities, such as sclerotic, thickened or calcified valves, that were not sufficient to cause incompetence. The latter group consisted of persons with an average age of seventy-three years.

Material and Methods

The material for this study was obtained from examinations of civilian workers at a field under the supervision of an air-service command. The murmurs were usually discovered in the course of preemployment medical examinations and it was my responsibility to evaluate these and to recommend medically correct placement of the worker. A smaller number of the murmurs were heard in the course of examinations conducted for the evaluation of noncardiac defects.

All workers examined were employed on full time, performing light and arduous duties. Thirty-nine had symptoms referable to the cardiorespiratory system. In 21 of these patients, however, excessive short-windedness was the sole complaint. The ages varied from sixteen to seventy-four years, with an average of thirty-eight. There were 51 men and 40 women.

Only persons with systolic murmurs restricted to or maximal at the apex of the heart are included in this study. The apex is taken to include any point below the fourth rib and to the left of the sternum. If a separate basal murmur was present or if the murmur was louder at the base than at the apex, the case was not included. On the other hand, all apical systolic murmurs are included, even those audible only in certain positions. Systolic murmurs present only after exertion are excluded in view of the extremely high frequency of this finding.[4] All patients were auscultated in the left lateral recumbent position after exertion and were excluded from the study if a diastolic murmur became audible under these circumstances. In this way it was hoped to ascertain the cardiac status of persons who had systolic murmurs as their main abnormality on physical examination of the heart, since it is this auscultatory finding that is the source of confusion.

Careful inquiries were made for a past history of rheumatic infection, and this was said to be positive only when it included at least one of the following: an illness characterized by swollen, painful, tender joints; an illness of several weeks' duration, diagnosed at the time by the attending physician as rheumatic fever, prolonged bed rest recommended by a physician because of the discovery of a heart murmur; and St. Vitus's dance. A small number of patients had questionable histories, such as fleeting joint pains or a murmur after recovery from scarlet fever. These patients were classified as having no history of rheumatic infection.

Patients were classified as hypertensive if the systolic pressure exceeded 150 mm. or the diastolic 90 mm. All elevated pressures were repeated after the patient was recumbent for five minutes, since it was not practicable to wait for the desired twenty to thirty minutes.

Teleroentgenograms were taken of most of the patients, and almost all the remainder were fluoroscoped. If the latter procedure showed any questionable abnormality, a teleroentgenogram was taken. A heart was classified as enlarged only if it showed abnormal prominence of the left middle cardiac segment or if its size was 10 per cent greater than that predicted from the worker's height and weight.

Electrocardiograms were taken of all but a few patients, and minor degrees of axis deviation consistent with the patient's build were ignored. Because of the frequent occurrence of slurring of the QRS waves in normal persons,[11] this finding was also not regarded as abnormal.

It was not possible to perform red-cell counts of the blood in all cases. This was done only when there was a reason to suspect anemia clinically.

A murmur was considered to be associated with a cardiovascular abnormality when the patient had a history of rheumatic fever, hypertension, roentgenologic evidence of cardiac enlargement, an abnormal electrocardiogram or other disease that might be expected to produce a murmur.

Results

There have been several sources of confusion in the evaluation of systolic murmurs. It seems logical to treat basal and apical murmurs separately, since different lesions may be involved in their production. The intensity of the murmur may also be significant, and this has received attention in the work of White,[8] and of Freeman and Levine[4] discussed above. Levy, Stroud and White,[12] reporting on the results of re-examination of men rejected for military duty, also mention that the intensity of the murmur was used as a criterion for acceptability. Third, the age of the patient should receive consideration, in view of the pathological study of Rednick,[10] already discussed, in which the type of valvular lesion was related to the patient's age.

Significance of Intensity

The relevant facts obtained with the methods already described are set forth in Table 1.

Forty-seven per cent of the murmurs were classified as faint, 31 per cent as moderate and 22 per cent as loud. It is apparent that 78 per cent of these apical systolic murmurs were associated with at least one cardiovascular abnormality according to the criteria outlined. This proportion was lower in the cases in which the murmurs were faintest (74 per cent) and increased proportionately with increased intensity of the murmur, reaching 85 per cent when the murmur was loud. The increase was, however, only slight and may not be significant in view of the small number of cases involved.

Even if it is assumed that the significance of the murmur increases with intensity, it is apparent that faint systolic murmurs cannot be ignored and that a majority are associated with cardiovascular abnormalities. This has been the conclusion of others who have attempted to evaluate the significance of the intensity of murmurs.[4, 8] A relevant and vivid example is that of a nineteen-year-old girl who was told that she had had rheumatic fever at the age of 2 and who had an attack of polyarthritis at seventeen. As long as she could remember, she had had almost yearly episodes of heart failure, during which she was confined to bed with cough, ankle edema, dyspnea and orthopnea. A teleroentgenogram disclosed only slight exaggeration of the left middle cardiac segment. The PR interval of the electrocardiogram was 0.26 second, but on auscultation the only remarkable finding was a faint systolic murmur over the fourth interspace, to the left of the sternum.

Significance of Age

When the cases are divided into three age groups (Table 2) and the same factors are analyzed, several significant conclusions may be drawn. In all but 1 of the patients above fifty the apical systolic murmur was significant and was most frequently associated with hypertension. This is in sharp contrast to the lower age groups, in which the murmur was rarely associated with hypertension. In the youngest age group, below twenty-five, a history of rheumatic fever was obtainable in more than half the cases; this history was present less frequently as the age increased, and was found in only one fifth of the patients over fifty. From this it may be concluded that an apical systolic murmur in a young patient is likely to be associated with rheumatic fever, whereas in older persons hypertension is frequently present. Presumably, this is partly due to the failure of rheumatic patients to survive to old age. The higher proportion of abnormal electrocardiograms in the oldest age group is entirely due to the

Table 1. *Significant Clinical and Laboratory Findings Related to the Intensity of the Murmur.*

Finding	Degree of Intensity: Faint (43 cases) No.	Faint Percentage	Moderate (28 cases) No.	Moderate Percentage	Loud (20 cases) No.	Loud Percentage	Total (91 cases) No.	Total Percentage
History of rheumatic infection	14	33	11	39	7	35	32	35
Hypertension	6	14	11	39	5	25	22	24
Roentgenologic enlargement	9	21	11	39	9	45	29	32
Abnormal electrocardiogram	19	44	10	36	9	45	38	42
PR interval greater than 0.20 sec.	9		4		3		16	
Left-axis deviation	3		3		4		10	
ST and T abnormalities*	6		4		2		12	
Low voltage of QRS†	3		2		1		6	
QRS duration of 0.15 sec.	1		0		0		1	
Miscellaneous‡	3		0		1		4	
Total cases with at least one of above positive findings	32	74	22	79	17	85	71	78

*Deviation of ST greater than 1 mm. from isoelectric line; T_1 and T_2 inverted or less than 1 mm. in amplitude; T_4 inverted or less than 0.5 mm. in amplitude.

†Total amplitudes of QRS of limb leads less than 15 mm., with none greater than 5 mm.

‡Includes 1 case each of angina pectoris, hyperthyroidism (pulse rate of 120), leukemia and anemia (red-cell count of 3,500,000).

frequent presence of left-axis deviation, which is related to the high incidence of hypertension.

Significance of Laboratory Examinations

On hearing a systolic murmur, with no other abnormality present, it is a frequent practice for physicians to try to elicit a history of rheumatic fever, measure the blood pressure and attempt to explain the murmur clinically. If this is impossible, and especially if the murmur is faint, the patient is usually told that the murmur is of no significance. It was therefore considered important to report the x-ray and electrocardiographic findings in the patients who appeared negative by clinical examination (Table 3). This means that the patients had no rheumatic history, hypertension, tachycardia or fever and that there were no findings suggesting other disease that could produce a murmur. Although the incidence of abnormal laboratory findings was lower in such patients than in the group as a whole, half of them had enlarged hearts or abnormal electrocardiograms. These evidences of heart disease would have been completely missed without the more elaborate examinations. Furthermore, even when there were faint murmurs and no clinical findings, objective evidence of cardiac abnormalities was seen in half these cases. It is justifiable to conclude that no systolic murmur, regardless of intensity, can be adequately evaluated without thorough laboratory studies.

TABLE 2. *Significant Clinical and Laboratory Findings Related to the Age of the Patient.*

FINDING	AGE GROUP: BELOW 25 YR. (28 CASES)		25–50 YR. (35 CASES)		ABOVE 50 YR. (28 CASES)	
	No.	Percentage	No.	Percentage	No.	Percentage
History of rheumatic infection	15	54	11	31	6	21
Hypertension	2	7	3	9	17	61
Roentgenologic enlargement	10	36	11	31	8	29
Abnormal electrocardiogram	7	25	12	34	19	68
PR interval greater than 0.2 sec.	3		7		6	
Left-axis deviation	0		1		9	
ST and T abnormalities	4		3		5	
Low voltage of QRS	0		3		3	
QRS duration of 0.15 sec.	0		0		1	
Miscellaneous*	0		2		2	
Total cases with at least one of above positive findings	21	75	23	65	27	96

With the intensity of the murmur, faint murmurs were associated with these abnormalities in about 75 per cent of the cases showing them.

Almost all murmurs in the oldest age group (above fifty) were associated with other cardiovascular findings, most frequently with hypertension. In the younger age groups, the murmurs were less frequently significant, although positive findings were present in about 75 per cent of the cases. In the younger age groups, the murmurs were rarely associated with hypertension but often with a history of rheumatic fever. The incidence of this history decreased as the age of the subjects increased.

TABLE 3. *Significant Roentgenologic and Electrocardiographic Findings in Patients with Clinically Negative Apical Systolic Murmurs.*

FINDING	DEGREE OF INTENSITY: FAINT (22 CASES)	MODERATE (9 CASES)	LOUD (8 CASES)	TOTAL (39 CASES)
Roentgenologic enlargement	4	1	4	9
Abnormal electrocardiogram	10	2	4	16
PR interval greater than 0.2 sec.	6	1	2	9
Other abnormalities	6	1	3	10
Total case findings with at least one of above	12	3	5	20

SUMMARY AND CONCLUSIONS

The clinical and laboratory findings of 91 full-time employees with apical systolic murmurs are presented.

In 71 (78 per cent) of these, the murmur was associated with significant cardiovascular abnormalities. Although this proportion increased slightly with the intensity of the murmur, faint murmurs were associated with these abnormalities in about 75 per cent of the cases showing them.

Almost all murmurs in the oldest age group (above fifty) were associated with other cardiovascular findings, most frequently with hypertension. In the younger age groups, the murmurs were less frequently significant, although positive findings were present in about 75 per cent of the cases. In the younger age groups, the murmurs were rarely associated with hypertension but often with a history of rheumatic fever. The incidence of this history decreased as the age of the subjects increased.

Approximately half of 39 persons with apical systolic murmurs as the sole significant clinical finding had enlarged hearts roentgenologically or abnormal electrocardiograms. This was true even when the murmur was faint.

It is concluded that apical systolic murmurs are frequently associated with other cardiovascular findings, regardless of the intensity of the murmur, especially in patients over fifty. No systolic mur-

mur can be adequately evaluated without roentgenologic estimation of the heart size and an electrocardiogram.

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SEROLOGIC TYPES OF HEMOLYTIC STREPTOCOCCI IN SCARLET FEVER IN MASSACHUSETTS*

G. E. Foley†, W. L. Aycock, M.D.,‡ and R. D. Cox, M.D.§

BOSTON

CONTINUING the study previously reported,[1] the hemolytic streptococci isolated from throat swabs of patients admitted to various Massachusetts hospitals with scarlet fever during 1944 were classified as to serologic type. The laboratory studies were again done at the Department of Preventive Medicine and Epidemiology, Harvard Medical School, and arrangements for the provision of throat cultures were made through the co-operation of the Division of Communicable Diseases, Massachusetts Department of Public Health.

During the past year a total of 839 additional throat swabs were examined, of which 640 (76.3 per cent) were positive for Group A hemolytic streptococci.|| The methods employed in the type classification of these strains were the same used for those referred to in the previous report. The distribution of the typed cases by age, sex and season corresponded closely to that of the total incidence of scarlet fever in Massachusetts during the period of study.

Table 1. *Distribution of Predominant Serologic Types of Hemolytic Streptococci in Cases of Scarlet Fever in Massachusetts, 1944.*

Community	No. of Cases Typed	Predominant Types: First Type	First Percentage	Second Type	Second Percentage	Third Type	Third Percentage	Percentage of Predominant Types
Arlington	39	2	41	1	26	5	18	85
Boston	73	2	51	1	27	6	8	86
Malden	40	19*	35	2	33	1	2	70
Newton	22	2	64	17†	13	1	13	90
Somerville	41	2	41	1	39	6	7	87
Worcester	425	2	32	1	24	19*	14	70

*Weak cross-reaction with Types 4, 24, 26 and 29.
†Cross-reaction with Type 23.

Table 2. *Distribution of Predominant Serologic Types of Hemolytic Streptococci in Cases of Scarlet Fever in Massachusetts, 1938–1944.*

Community	Year	No. of Cases Typed	Predominant Types: First No.	First Percentage	Second No.	Second Percentage	Third No.	Third Percentage	Percentage of Predominant Types
Boston	1938–1939[2]	340	15	45	13	4	11	3	52
	1939–1940[3]	35	2	55	6	11	—	—	66
	1942[1]	19	2	69	19*	11	8	10	90
	1943[1]	7	2	80	19*	20	—	—	100
	1944	73	2	51	1	27	6	8	86
Worcester	1942[1]	34	2	63	19*	11	8	6	80
	1943[1]	351	2	40	1	21	8	10	71
	1944	425	2	32	1	24	19*	14	70
Total of all communities studied	1942[1]	69	2	57	19*	22	8	6	85
	1943[1]	358	2	26	1	26	8	18	70
	1944†	640	2	36	1	26	19*	12	74

*Weak cross-reaction with Types 4, 24, 26 and 29.
†Type 6 (7%) and Type 8 (6%) were fourth and fifth, respectively, in order of frequency.

Distribution of Types

The percentage distribution of the predominant types of hemolytic streptococci isolated from scarlet-fever patients in several Massachusetts communi-

*From the Department of Preventive Medicine and Epidemiology, Harvard Medical School and Harvard School of Public Health.

†Assistant bacteriologist, Massachusetts General Hospital; formerly, technical associate, Department of Preventive Medicine and Epidemiology, Harvard Medical School and Harvard School of Public Health.

‡Associate professor of epidemiology, Department of Preventive Medicine and Epidemiology, Harvard Medical School and Harvard School of Public Health.

§Medical director, Communicable Disease Division, Belmont Hospital, Worcester, Massachusetts.

||During the period 1942–1944, throat cultures in 1470 cases of scarlet fever were examined. Of these, 1067 (73 per cent) were positive for Group A streptococci.

ties is presented in Table 1. The consistency of the frequency with which certain types were recovered from the majority of cases in different localities is noteworthy. In Table 2, the data concerning types of streptococci prevalent in two Massachusetts communities for successive years are compared with those for the entire sample typed in the present studies during the period 1942–1944. The additional data presented in Table 2 lend support to the observation previously recorded: *viz.*, in the period studied certain types tended to maintain themselves as the cause of scarlet fever in a large proportion of cases.[1]

Scarlatinal and Nonscarlatinal Infections

Since these studies were done on patients admitted to infectious-disease hospitals, there was but limited opportunity to study nonscarlatinal infections. An occasional swab, however, was received from a patient admitted to the hospital for one reason or another with a streptococcal infection other than scarlet fever. A total of 44 cultures from such cases were studied. Of these, 33 (75 per cent) were positive for Group A hemolytic streptococci. The frequency with which the various serologic types were encountered may be compared with the frequency with which these and other types were isolated from patients with a clinical diagnosis of scarlet fever (Table 3). Two important and often

Table 3. *Frequency of Serologic Types of Hemolytic Streptococci in Cases of Scarlet Fever and of Other Streptococcal Infections in Massachusetts, 1942–1944.*

Serologic Type	Percentage Incidence	
	Scarlet Fever	Other Streptococcal Infections
2	36.6	30.3
1	23.9	21.2
19*	12.1	18.2
8	11.0	3.0
6	6.3	
17†	3.6	12.1
25	1.5	6.0
5	1.2	
12	0.9	3.0
29*	0.7	3.0
27	0.4	3.0
4*	0.3	
11	0.3	
14	0.3	
18	0.3	
13	0.2	
15	0.2	
10	0.1	
24*	0.1	

*Serologically related with the serums used.
†Cross-reaction with Type 23.

neglected points are illustrated in this small series. In the first place, there is no single serologic type peculiar to the clinical diagnosis of scarlet fever. Secondly, a predominant type can be recovered from patients with nonscarlatinal infections with the same degree of frequency with which it is found in scarlet fever. It thus appears that in this series of cases the factor that determines one clinical syndrome or another is not the type of streptococcus but probably differences in susceptibility or resistance to erythrogenic toxin (common to most types of streptococci), as has previously been pointed out by Gordon.[4] Age is a factor that determines in part the host reaction to erythrogenic toxin. Of the patients in this study with a diagnosis of scarlet fever, 83 per cent were less than fifteen years of age, compared with 15 per cent of those with a diagnosis other than scarlet fever.

Serologic Type

These studies are perhaps still too limited to support any sweeping conclusions concerning the geographic limitations and constancy of a serologic type pattern in scarlet fever. It is of interest, however, that in five of the six communities from which samples were obtained during 1944, Types 2 and 1 were predominant causes of scarlet fever. The available evidence suggests that the Type 2 organism has maintained itself predominantly in scarlet fever in Massachusetts since 1939–1940 (Table 2). Type 1 appeared in appreciable numbers of cases in 1943, replacing Type 19. Despite the fluctuation in relative frequency, the percentage of scarlet fever that could be attributed to two or three predominant types remained fairly constant from year to year during the period of study.

The movement of a particular serologic type of hemolytic streptococcus is difficult to follow in a community of any size. Since dissemination can be accomplished by the carrier as well as by the patient, it is usually impossible to determine the exact epidemiologic relation between cases of endemic scarlet fever. In the present study, spot maps prepared according to serologic type by street address in a large community failed to reveal any significant grouping of cases by type. On the other hand, the results of family studies[5] and schoolroom studies[6, 7] indicate that if the population group can be broken down into basic epidemiologic units amenable to complete study, the movement of a given serologic type can be followed. For example,

Table 4. *Serologic Types of Hemolytic Streptococci Isolated from Multiple Cases of Scarlet Fever and Other Streptococcal Infections in 97 Families in Massachusetts, 1942–1944.*

Serologic Type	No. of Primary and Co-primary Cases	No. of Secondary Cases
2	38*	27†
1	27*	20
8	10	12
6	16	10
19‡	8§	5
5	2	1
15	1	1
12	2	0
17¶	1	1
14	1	1
Totals	106	78

*One case of septic sore throat.
†One case of abscessed finger.
‡Weak cross-reaction with Types 4, 24, 26 and 29.
§Two cases of streptococcal meningitis.
¶Cross-reaction with Type 23.

during the past year the serologic types of hemolytic streptococci isolated from multiple cases of scarlet fever and other streptococcal infections occurring in sixty-one families were obtained. The strains isolated from multiple cases in each household were of the same serologic type. In Table 4 the

data on these families are combined with those on thirty-six families previously reported.[1] It has been postulated that the diversity of types encountered in endemic scarlet fever may reflect the fact that the endemic disease, as it is known in this country, is the result of multiple introductions of various types of organisms, in contrast to outbreaks from a common source, which are usually due to a single serologic type.[8]

Seasonal change has a profound effect on the incidence of scarlet fever, the seasonal variations throughout the summer months. It seems that the annual variations are determined by a secondary seasonal influence superimposed on the broader cyclic influence.

The seasonal changes observed in streptococcus-carrier rates are similar to those of scarlet fever.[10] The seasonal fluctuations in the carrier rate are due to seasonal fluctuations in the prevalence of Group A strains, the other strains remaining at a more or less constant level throughout the year.[11, 12] The annual seasonal increase in the Group A carrier

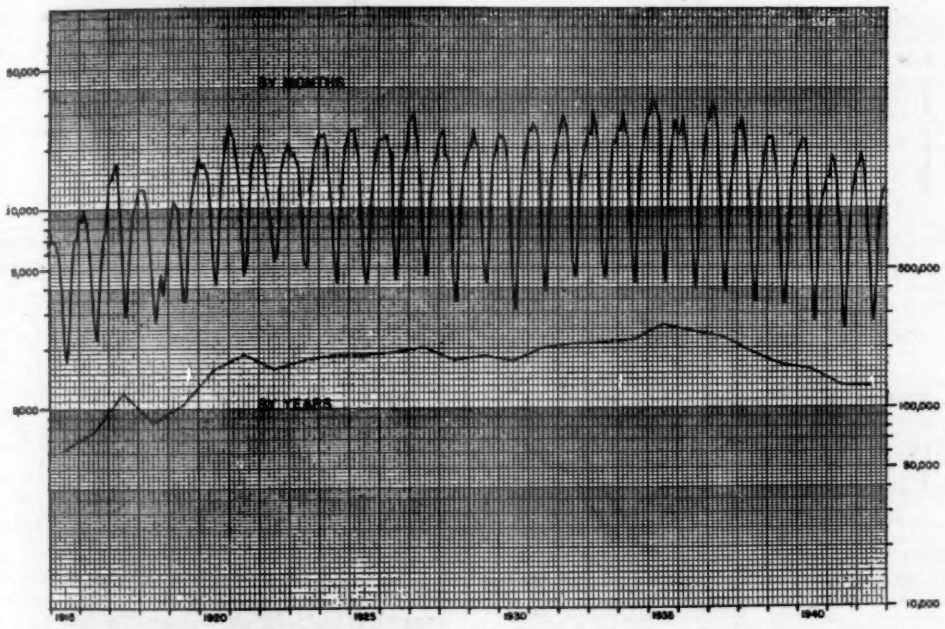

FIGURE 1. *Incidence of Scarlet Fever in the United States Registration Area, 1915–1942. The data were obtained from* Public Health Reports *for the corresponding years.*

incidence for a given locality being remarkably regular. In Massachusetts, for instance, during the period 1925–1939 distinct peaks of incidence occurred eleven times in March and twice in January and the low point of incidence was reached twice in July and eleven times in August.

In addition to annual seasonal variations in incidence, scarlet fever presents some evidence of a broad cyclic movement over a period of years similar to that observed in other infectious diseases of bacterial origin.[9] In Figure 1 is plotted the monthly incidence of scarlet fever in the United States Registration Area for the years 1915–1942. The regularity with which the points of high and low incidence undulate indicates not only that the high and low points in a single year are related, but also that the total incidence in a given year is related to that in the preceding year and in turn influences the incidence in the following year. It should be noted that the incidence of scarlet fever does not approach zero during the season of lowest incidence but continues to occur in sizable numbers of cases

rate has been interpreted as a precursor of streptococcal infection, but it has not yet been established that an increased carrier rate is the cause rather than the result of streptococcal disease. Certainly the coincident seasonal changes in the incidence of scarlet fever and the Group A carrier rate suggest the influence of a basic phenomenon common to both.

The distribution of the predominant types of hemolytic streptococci isolated from scarlet fever occurring in a single Massachusetts community during the epidemic year 1943–1944 is plotted in Figure 2. The incidence of either Type 2 or Type 1 varied with the progression of the seasons in the same manner as does the incidence of scarlet fever in the United States Registration Area. As can be seen from the curves in this figure, the rates of increase and decrease during the period of observation were the same for both these types. Additional analyses indicate that the same was true of the other less prevalent serologic types during the same period. As was recently pointed out,[13] the similarity

of two distributional curves suggests the operation of the same factor producing the identical result in each. The obvious factor common to both Types 2 and 1, as well as to other serologic types, is seasonal change rather than some ill-defined difference in the ability of certain types to acquire new hosts.

Discussion

The original purpose of Griffith's[14] serologic investigations was to establish that scarlet fever is or is not produced by a distinct species of hemolytic streptococcus. The accumulated evidence of the occurrence of all Griffith's types in scarlet fever, as well as in other streptococcal infections, has established the essential unity of streptococcal disease in general. The observation that the common erythrogenic toxin is broadly valent to nearly all serologic types explains the heterogeneity of types encountered in scarlet fever. These and similar observations suggest that the disease-producing capacity of the hemolytic streptococcus — if indeed it is a parasitic rather than a host factor — is not entirely dependent on differences in type or even in group antigens, but more probably on some common denominator that exists irrespective of serologic characteristics. Evidence is accumulating that the ability to produce human disease is not peculiar to Group A strains alone. Infections due to other groups of streptococci are admittedly rare as compared with Group A infections, but they do occur.[15–21] Such infections are usually nonrespiratory in origin, such as the cases recorded in Table 5. Recent studies on the relation of hyaluronic acid to the virulence of Group C[22] and Group A hemolytic streptococci[23] support the hypothesis that serologic characteristics may be incidental to pathogenicity. Indeed, the everyday observation that all serologic types can produce the same clinical syndrome in itself supports the existence of a common denominator for all types.

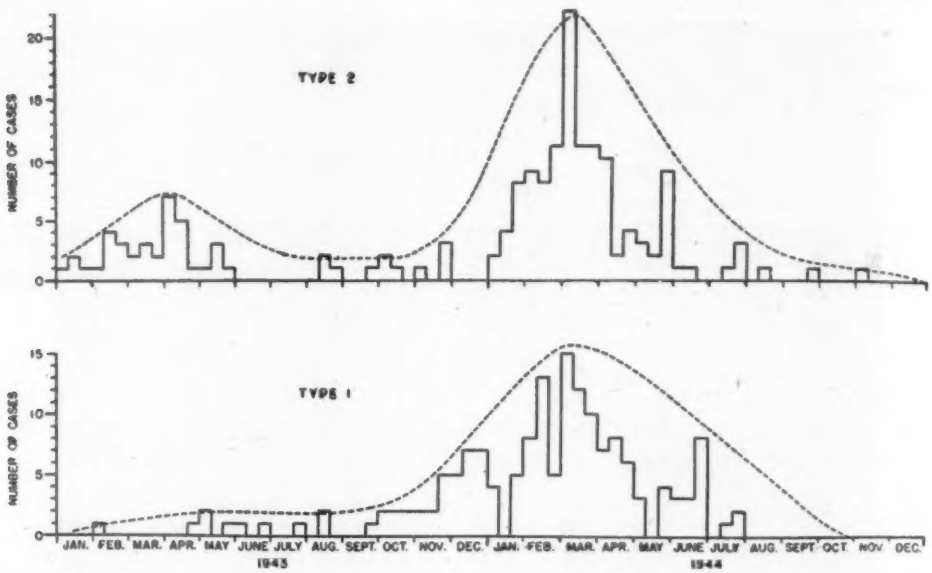

Figure 2. *Annual and Seasonal Variations in Certain Serologic Types of Hemolytic Streptococci in Scarlet Fever Occurring in a Single Community, 1943–1944.*
The figures do not include multiple cases in the same household.

Table 5. *Streptococci Other than Group A Isolated from Cases of Human Infection.**

Clinical Diagnosis	Source of Culture	Group
Meningitis	Spinal fluid	B
Meningitis	Spinal fluid	B
Urinary infection	Catheterized urine	B
Sepsis	Blood	D
Sepsis	Blood	D
Sepsis	Blood	E
Empyema	Fluid from surgical drainage	F
Empyema	Fluid from surgical drainage	F
Empyema	Fluid from surgical drainage	G

*In each case streptococci were present either in pure culture or in predominant numbers.

Although studies on the antigenic differences among the streptococci have not yet contributed substantially to knowledge of the fundamental mechanics of streptococcal infection, they have provided the epidemiologist with a means of studying related cases of this group of diseases. Either the M-precipitin[24] or the slide-agglutination[14] technic, when properly applied to the study of an outbreak, can add valuable information to the study. From an epidemiologic viewpoint, it seems to matter little which method is used, since either provides only a means of identifying the movement of a particular strain.†

†In view of the current observations on discrepancies in the results obtained with the two methods, it may be pointed out that since the two technics can involve different antigen-antibody systems, any degree of correlation should not be expected with serums prepared and standardized against different type antigens.

Summary

Types of hemolytic streptococci associated with scarlet fever in certain Massachusetts communities during 1944 were predominantly, in order of frequency, Types 2, 1, 8 and 19. Similar type distributions were obtained in the study previously reported for 1942–1943. During the three-year period of this study, there was some shifting of type in relative order of frequency, but Type 2 seemed to maintain itself as a major cause of scarlet fever.

During the course of this study, 1067 cases of scarlet fever were classified with respect to the serologic type of the streptococcus, 19 types being encountered. The frequency with which a given type was isolated from cases of nonscarlatinal infection was essentially the same as that in cases of scarlet fever. Additional observations on multiple cases in the same family indicate that household outbreaks are usually due to a single serologic type.

Spatial relations could not be demonstrated among cases of scarlet fever due to the same serologic type except in basic units of population, such as a family. A study of the seasonal distribution of the predominant types in scarlet fever indicated that the prevalence of a particular type fluctuated with season in a manner similar to that of scarlet fever. A study of the incidence of scarlet fever in the United States Registration Area over a period of years suggests that annual seasonal variations are superimposed on a broad cyclic movement covering a period of years.

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MEDICAL PROGRESS

HEMOGLOBINEMIA AND THE HEMOGLOBINURIAS (Concluded)*

JOSEPH F. ROSS, M.D.†

BOSTON

MYOGLOBINURIA AND THE CRUSH SYNDROME

During the blitz on London in 1940, English physicians began to see air-raid casualties who developed an unusual and highly fatal form of renal failure.[97] All these patients had been buried under rubble for a period of hours, and usually one or more extremities had been crushed or severely compressed by heavy timbers or masonry. Many of these persons appeared to be in good general condition soon after release from compression, but after an hour or two the signs of vascular collapse or shock developed, with pallor, cold perspiration, a weak, thready pulse and a precipitous drop in blood pressure. The traumatized limb became greatly swollen, paralyzed and insensitive, and on operation large masses of muscle were found to be necrotic. Restoration of blood volume by transfusion of plasma or blood usually restored the blood pressure to normal, the signs of shock disappeared, and the patients appeared to be well on the way to recovery. This improvement and the good subjective appearance of these patients were most deceptive, however. The volume of urine excreted became smaller and smaller, signs of extreme renal failure appeared, the blood urea concentration rose to high levels, the blood pressure became elevated, and death usually occurred quite suddenly on the sixth or seventh day after the initial injury.

Urine voided after release of the compression was "smoky," brown or occasionally red and often contained a heavy brown precipitate. Spectroscopic examination of these urines showed no hemoglobin or methemoglobin but oxymyoglobin and metmyoglobin.[7] The brown precipitate was identified as acid hematin. All the urines were highly acid with the reaction as low as pH 4.6.[97] Excretion of myoglobin usually continued for one or two days, but casts containing granules of acid hematin could be demonstrated in the urine for five or six days more.

The volume of urine excreted progressively decreased, its composition becoming similar to that of glomerular filtrate: the urea concentration was low, although the blood urea was high, the chloride content was high although the plasma chloride was low and, finally, reducing substances appeared.[98] Bywaters and Dible[99] attributed these changes to almost complete loss of tubular function and suggested that the small volume of urine could be accounted for by leakage of glomerular filtrate back into the blood stream through the damaged tubules. Potassium and creatinine presumably derived from the damaged muscle were present in high concentration in the first specimens of urine voided after release of the compression.

In two thirds of the 100 cases reported the patients died, usually on the sixth day. The circumstances of death were suggestive of fatal potassium poisoning, with death from cardiac irregularity. Electrocardiographic abnormalities were similar to those noted in potassium poisoning, and the concentration of potassium in the serum was more than twice the normal value.[97] The accumulation of such large amounts of potassium in the plasma was brought about by two mechanisms: the release of large amounts of potassium from the damaged muscle and the failure of the kidneys to excrete it in adequate amounts because of oliguria and renal failure.

At autopsy the kidneys showed the picture so frequently found in cases of intravascular hemolysis. The glomeruli were normal, but the epithelial cells of the convoluted tubules were necrotic, and many tubular lumens contained brown casts of myoglobin.[99] Studies of the traumatized areas showed that large masses of muscle were pale and flabby, looked like "fish flesh" and were necrotic. Most of the myoglobin, potassium, phosphorus, creatine and glycogen had been lost from such muscle.[97]

The sequence of events and the pathogenesis of the crush syndrome may be summarized as follows. Because of the crushing injury, or prolonged anoxemia, a mass of muscle is so badly damaged that it becomes necrotic. On release of the compressing force, plasma escapes into the traumatized area, frequently in large enough amounts to produce a critical decrease in the circulating blood volume, with consequent shock. The intracellular constituents of the damaged muscle cells, notably myoglobin, potassium, creatine and acid metabolites, escape into the blood stream, and to the decreased blood volume and hypotension are added the complicating factors of acidosis, a toxic plasma concentration of potassium, myoglobinemia and myoglobinuria. The combination of these factors results in decreased glomerular filtration, tubular necrosis and precipitation of myoglobin casts in the

*From the Robert Dawson Evans Memorial, Massachusetts Memorial Hospitals, the Department of Medicine, Boston University School of Medicine, and the Department of Biological Chemistry, Harvard Medical School. Prepared under tenure of a Welch Fellowship in Internal Medicine of the National Research Council.

†Associate professor of medicine, Boston University School of Medicine; research fellow in biochemistry, Harvard Medical School; Welch Fellow in Internal Medicine, Division of Medical Sciences, National Research Council; member, Robert Dawson Evans Memorial; physician, Massachusetts Memorial Hospitals.

highly acid glomerular filtrate. The capacity of the tubules to selectively reabsorb water and chlorides is lost, and urea and potassium are retained. The retention of potassium, coupled with its continued escape into the blood stream from the damaged muscle, leads to toxic plasma levels, eventual cardiac arrest and death.

Bywaters and Popjak[100] and Bywaters and Stead[101] attempted to establish the comparative importance of compression, of muscle necrosis and of myoglobinuria in the production of renal failure. Their experimental work was performed on rabbits that had almost no myoglobin in their muscles, and it was necessary to infuse solutions of human myoglobin to produce myoglobinuria. It was found that crushing injury to muscle produced shock and transitory azotemia but not renal failure. Myoglobinuria caused no ill effects in normal rabbits but resulted in severe renal damage, uremia and death in animals in which severe acidosis or crushing injury had been produced. Autopsy of these animals showed kidney lesions similar to those noted in fatal human cases of the crush syndrome.

In contrast to these findings are the previously described observations of Bing,[31] who found that injections of solutions of pure dog myoglobin produced no significant abnormality in the renal function of normal or acidotic dogs. This does not exclude the definite probability that myoglobinuria occurring in patients in a state of shock, as well as in acidosis, may severely damage the kidneys. Furthermore, it must be emphasized that observations made in one animal species are not necessarily applicable to another species or to man.

Although the crush syndrome and myoglobinuria were first described in the English literature in 1941, the condition was recognized by the Germans during World War I and their observations were summarized by Minami.[102] It is probable that the syndrome follows many different types of trauma — for example, automobile and industrial accidents — and that it is not recognized because attention is focused on the surgical aspects of the injuries.[97]

Prophylactic measures to prevent renal damage are of the utmost importance in caring for persons who have been victims of compressing and crushing injuries. Prior to the release of the pressure, or as soon thereafter as possible, it appears advisable to administer transfusions of blood or plasma and to give fluids in amounts adequate to maintain a relatively normal circulating blood volume and good urinary flow. Judicious use of alkalies is probably advisable in an attempt to maintain an alkaline urine reaction.

Treatment of a patient with the crush syndrome once it is fully developed appears to have little influence on the eventual outcome of the case. The administration of large amounts of alkali in the face of already established oliguria is of little value and may actually be harmful.[34] Every attempt should be made to maintain the concentration of blood electrolytes as normal as possible — a difficult task in view of the tendency to accumulate potassium. Bywaters[97] states that the administration of insulin and dextrose to these patients may reduce the blood potassium level and may improve the cardiac function.

Paralytic Myoglobinuria and Haff Disease

Paralytic myoglobinuria is an extremely rare disease of man, only 8 cases having been reported.[103] It occurs not infrequently in work horses, however, and is said to be well known to veterinarians.[104] The symptoms are similar in men and horses. The disease affects previously healthy individuals who have been inactive for a few days but who have continued to eat the same diet that they consumed when performing heavy physical exertion. On returning to work they develop stiffness and lameness of one or more muscle groups, rapidly lose strength and are soon paralyzed. Twitching of the muscles is often noted. Chills and fever occur, and dark red urine is passed. Renal failure and uremia similar to that described in the crush syndrome sometimes develop and may prove fatal in five or six days. The plasma potassium concentration becomes markedly elevated.[105] If death does not occur, there may be residual paralysis of the affected muscle groups. Repeated attacks are frequent in nonfatal cases.[103]

The pigment passed in the urine has been identified as myoglobin.[106, 107] Autopsied cases show edematous, pale muscles, which are described as looking like "fish flesh." The kidneys show tubular degeneration and myoglobin casts and are similar in appearance to those found in patients dying of the crush syndrome.[103]

It has been postulated by Carlström[107] that the cause of the disease is damage to the muscle cells by the sudden release of large amounts of lactic acid. Excessive amounts of glycogen are stored in the muscles during rest, and on return to activity this glycogen is converted to lactic acid so rapidly that it cannot be removed by diffusion. It consequently accumulates in the muscle cells in such a high concentration that the cells are damaged, myoglobin, potassium and creatine readily diffusing into the blood stream. Minett[104] produced the disease experimentally by feeding resting horses a high-carbohydrate diet and then exercising them, tending to confirm Carlström's hypothesis.

A somewhat similar condition, known as "Haff disease" and characterized by paroxysmal attacks of severe pain, stiffness and limitation of motion of the striated muscles and the passage of red or black urine, has been described in inhabitants living near the sea inlet or *Haff* in Königsberg, Germany.[108] The urinary pigment has been identified as myoglobin,[109] and autopsied cases showed necrotic striated muscles that looked like "fish flesh." The disease is supposedly caused by ingestion of fish

or eels poisoned with resinous acid wastes discharged into the inlet from the nearby cellulose factories. Stoeltzner[108] has experimentally produced the disease in cats by poisoning fish with these resinous acids and by feeding the fish to the cats, which promptly developed acute muscle necrosis and myoglobinuria.

March Hemoglobinuria

March hemoglobinuria is the only condition in which the appearance of hemoglobin in the urine does not indicate serious systemic disease. It occurs exclusively in healthy, young adult men and is precipitated by walking or running but not by other types of physical exertion. Nor is it related to chilling, fever, sleep, hyperventilation or local hemostasis, as Gilligan and Blumgart[110] have demonstrated. There is no associated disease or physical abnormality, and no racial or familial predisposition. It usually is entirely asymptomatic except for the appearance of red urine following a period of walking or running; occasionally the subject may experience aching or drawing pain in the lower back or abdomen.[111, 112] Hemoglobinuria persists for a few hours following exertion in most cases, but it may last for several days in rare cases.[113] The spleen has been noted to increase in size following attacks in 1 case,[110] and similar enlargement of the liver has been described in 2 cases.[110, 114]

The type of exertion and the posture of the subject are most important in producing attacks of march hemoglobinuria. With the exception of a case described by Witts[66] in which bicycling as well as walking produced attacks, hemoglobinuria occurs only after walking or running. Other types of exertion, such as wood chopping, bicycling or arm exercise, produced no hemoglobinuria, although the exertion was greater than that which would have been required to produce hemoglobinuria by walking; furthermore, prolonged standing or reclining in a lordotic position never caused hemoglobinuria.[110] Although the majority of patients have had no postural abnormality, some have demonstrated an exaggerated lumbar lordosis that has been suspected of being responsible for the attacks.[66, 112, 114, 115] In 2 cases, the obliteration of the normal lumbar curve and the production of a slight kyphosis by the application of a plaster cast served to prevent the development of hemoglobinuria after an amount of exercise that otherwise would have produced an attack.[110, 114] In one of these cases in which the plasma hemoglobin was investigated, not only did the kyphotic position prevent the appearance of hemoglobin in the urine but it also prevented any increase in plasma hemoglobin, indicating that the change in posture in some way prevented the occurrence of hemolysis. This highly significant observation suggests that some vascular or circulatory abnormality may be responsible for the hemolysis, but as Gilligan and Blumgart[110] point out, there is no definite evidence that there is any such abnormality.

March hemoglobinuria is self-limited, and recovery usually occurs without treatment within a few months or one or two years, although it may occasionally last longer. Witts[66] reported a case with occasional attacks during a seven-year period, and Foerster[116] described a patient with attacks for twenty years.

Relatively little was known of the pathologic physiology of march hemoglobinuria until the excellent studies of Gilligan and Blumgart,[110] who investigated 3 cases and summarized the observations on all reported cases. Although the attacks are precipitated by muscular activity, the heme pigment excreted in the urine is not myoglobin from the muscles but oxyhemoglobin derived from the blood. Hemoglobinemia always precedes the appearance of hemoglobin in the urine, and after mild exertion may occur without hemoglobinuria. The renal threshold for hemoglobin is considerably lower than that in normal persons. The amount of blood hemolyzed during attacks usually does not exceed 40 cc. and is invariably too small to produce anemia.

There is no abnormality in the blood to account for the increased hemolysis. The erythrocytes, leukocytes and platelets are normal in number and morphology. The fragility of the erythrocytes is normal, and no abnormal agglutinins or hemolysins are present in the serum.

Kidney function is normal and is not influenced by attacks, although small quantities of albumin appear in the urine when there is hemoglobinuria.

Gilligan and Blumgart[110] have done much to clarify the etiology of march hemoglobinuria. Reviewing the various theories concerning its cause, they have shown that the belief that it is related to paralytic myoglobinuria[111, 116] is unfounded since the pigment excreted is hemoglobin and not myoglobin. There is no evidence to support the suggestion that hemolysis occurs in the kidneys, perhaps as a result of hemostasis in the renal veins,[115] and that the majority of the released hemoglobin is excreted in the kidneys.[66] Indeed, only 10 per cent of the liberated hemoglobin appears in the urine. The importance of the standing posture and the occurrence of lumbar lordosis in a few cases led Fisher and Bernstein[112] to associate the mechanism of production of march hemoglobinuria with that of orthostatic albuminuria. Patients with orthostatic albuminuria do not have hemoglobinuria, however, and prolonged standing without exercise does not cause albuminuria in subjects who develop march hemoglobinuria on exertion.[110]

Gilligan and Blumgart[110] offer what seems to be the most logical explanation of the disease. They suggest that it is merely an accentuation of a physiological hemoglobinemia and hemoglobinuria that occurs in normal, healthy persons following extremely vigorous and prolonged exertion. They demonstrated increased concentrations of hemo-

globin in the plasmas of 9 of 21 cross-country runners and of 18 of 22 marathon runners on completion of their races. Three of the marathon runners showed frank hemoglobinuria. Other observers have also reported a high incidence of hemoglobinemia and hemoglobinuria after long-distance runs and forced marches.[117, 118] Persons with march hemoglobinuria probably develop this physiologic hemolysis during less strenuous exercise than usual and, because of a lowered renal threshold for hemoglobin, readily show hemoglobinuria. Their lowered renal threshold may be a reflection of a moderate tubular blockage by hemoglobin breakdown products that has been brought about by the frequent occurrence of subthreshold levels of hemoglobinemia necessitating the frequent tubular reabsorption of hemoglobin. The mechanism by which erythrocytes are destroyed in normal persons during severe exertion or in patients with march hemoglobinuria during moderate exertion remains unexplained.

Favism

Favism is a form of acute hemolytic anemia and hemoglobinuria caused by the ingestion of the green seeds of the fava bean (*Vicia fava*) or by the inhalation of its pollen. It occurs most frequently on the island of Sardinia, where it is stated by Luisada[119] that many thousands of cases occur every year. The disease is also fairly common in Sicily and in some districts of the Italian mainland. It is exceedingly rare in the United States, only 3 cases having been reported.[120–122] This is in spite of the fact that considerable quantities of fava beans are consumed in the United States. The high incidence of the disease in Sardinia, Sicily and Calabria has been explained on the basis of increased racial susceptibility, since the inhabitants of these areas are said to have kept more of the "typical characteristics of the 'original' Mediterranean race" than have the other Italian peoples, who are less susceptible to the disease.[119] In 20 per cent of the cases a hereditary factor apparently plays an important role in predisposing to the disease. Certain families have been described in which every member for several generations developed the condition.[120] Attacks may occur in either sex and at any age, but are most serious in infants and children, in whom the mortality may reach 8 per cent. A person may experience repeated attacks.

The attacks may occur a few minutes to several hours after inhalation of the pollen or ingestion of the bean. The symptoms are those of rapid intravascular hemolysis, with chills, fever, vomiting, pain in the back and rapidly progressing anemia. Blood destruction may be so extreme and occur so rapidly that death from anemia occurs within twenty-four to forty-eight hours. Hemoglobinuria appears within a few hours of onset and may persist for several days. Jaundice develops after a few hours and may be intense. After the acute hemolytic episode there is rapid blood regeneration.

Oliguria, renal failure, uremia and death occasionally follow the hemoglobinuria. Studies of the blood have failed to reveal any changes in erythrocyte fragility, and the serum contains no abnormal hemagglutinins or hemolysins.[120–122]

Investigations of the etiology and pathogenesis of favism have not been extensive, and many of the reported studies have been poorly conceived and inadequately controlled. The disease is supposedly caused by an allergic response to the protein of the fava bean. A person may eat these beans for many years and suddenly develop an attack from the ingestion of a single bean. Milk from a goat fed on fava beans is reported to have contained enough of the antigenic material to produce a typical attack.[119] Fresh raw beans are more likely to cause the disease than dried or cooked ones. Approximately one third of the cases result from inhalation of the pollen from the blooming plants.

Allergy to the products of the fava bean manifests itself in skin sensitivity, as well as in the acute hemolytic reaction. Desensitization of the skin is reported to occur during the hemolytic reaction and may not reappear for several weeks.[119, 122]

Attempts to prove the allergic nature of the disease experimentally in rabbits were complicated by the direct hemolytic effect of the bean and its extracts on the animals.[119] The possible existence of a hemolytic agent in the bean is of considerable interest. As suggested by Ham and Castle,[123] a hemolytic agent in the fava bean may act in a fashion similar to the strongly hemolytic substance concanavalin A, which is derived from the fruit of another fabaceous plant, the jack bean. If such a hemolytic substance could be shown to exist in the fava bean, it would explain the pathogenesis of favism.

Hemolytic Transfusion Reactions

Hemolytic reactions to blood transfusions are unfortunately much more frequent and of far greater seriousness than is usually suspected. In a collected series of 43,284 transfusions, the incidence of hemolytic reactions was 1.8 per 1000 transfusions and the mortality was 1.4 per 1000 transfusions.[124] This mortality rate places the risk of blood transfusion in the same range as the risk of some major operations, a fact that is seldom recognized.

Hemolytic transfusion reactions are almost always the result of transfusion of intergroup[16–18] or Rh incompatible[125, 126] blood. Occasionally they may be due to the use of blood that is contaminated with bacteria or to blood that has been stored too long or in an improper fashion — for example, at the wrong temperature.

Following transfusion of incompatible blood there occur rapid intravascular agglutination and hemolysis of the donor cells, with resultant hemo-

globinemia, hemoglobinuria, chills, fever, profuse perspiration, nausea, vomiting and severe pains in the lower back. Occasionally there may be no subjective symptoms whatever, and rarely transfusion of incompatible blood may not cause serious complications.[127] The usual course of events in at least half the cases of incompatible transfusions is oliguria, anuria, uremia and death.[16, 124, 128]

The danger of using a Group 0, the so-called "universal," donor, has recently been re-emphasized by Malkiel and Boyd,[129] who reported that transfusions of Group 0, Rh compatible blood into a Group A recipient resulted in a severe reaction, with the destruction of 30 per cent of the recipient's cells. The donor blood was found to have a high concentration of anti-A agglutinin, which accounted for the destruction of the recipient's cells. In other reported cases, transfusion of compatible Group 0 blood has produced fatal hemolytic reactions.[128]

As previously discussed, the actual pathogenesis of the tubular degeneration and renal failure in these cases is not definitely established. In all probability they result from a lowered blood pressure, vasoconstruction of renal blood vessels, markedly reduced renal blood flow, lowered alkali reserve and the secretion of large amounts of hemoglobin or hemoglobin derivatives in a highly acid urine.

The treatment of hemolytic transfusion reactions is unsatisfactory, and it is far better to avoid the necessity for such treatment by establishing, unequivocably, the group and Rh compatibility of the donor and the recipient before transfusion. Care must also be exercised that bank blood has been stored under the proper conditions, and that the period of storage has not been too long.

The extreme seriousness of hemolytic transfusion reactions and the fact that about half the patients developing anuria die make it absolutely essential that effective therapeutic measures be instituted immediately in any patient suspected of having such a reaction. Retransfusion of fresh compatible blood as soon as possible after the reaction has occurred is probably of benefit, since it increases renal blood flow and promotes glomerular filtration.[33] Hesse[130] states that in 16 patients treated in this way, there were only 2 deaths, and in one of the latter, retransfusion was not performed until the sixth day. It also is advisable to maintain the blood electrolytes and alkali reserve as normal as possible and to try to keep the urine alkaline,[131] although excessive amounts of alkali should not be administered.[34] Procedures such as decapsulation of the kidneys, lavage of the renal pelves and sympathectomy probably are not therapeutically effective.

The Hemoglobinuria of Burns

Severely burned patients frequently develop hemoglobinuria and may show evidences of renal failure with renal lesions similar to those observed in other forms of intravascular hemolysis. The appearance of hemoglobinuria in a burned patient is a grave prognostic sign, not so much because of the severity of the hemolytic process, which rarely produces marked anemia, but because it is an indication that the burn is both extensive and serious in degree. Of the 10 burned patients with hemoglobinuria studied by Shen, Ham and Fleming[132] only 1 survived. One of Cope and Rhinelander's[133] 9 patients died.

The pathogenesis of the hemoglobinuria of burns has been explained by the excellent investigations of Shen, Ham and Fleming.[132] They observed that for several hours after the burn the blood of severely burned patients contained numerous spherocytic and fragmented erythrocytes and that the presence of these abnormal cells was reflected by a marked increase in the osmotic fragility of the erythrocytes. The number of abnormal red blood cells and the fragility changes progressively decreased after the burn as the abnormal cells were destroyed. By heating normal blood in vitro to a temperature of 51 to 65°F., they produced marked morphologic and fragility changes that were directly attributable to the effect of heat on the cells themselves and were not due to abnormalities produced in the plasma. When previously heated blood was transfused into normal dogs, hemoglobinemia and hemoglobinuria occurred and the changes in the appearance of the erythrocytes and in the osmotic fragility were identical with those seen in severely burned human patients.

The cause of burn hemoglobinuria is thus readily explained. At the time the burn is inflicted, the temperature of the burned tissue reaches or exceeds 51°C. and the blood passing through these tissues is heated to a similar temperature. The heat produces irreversible changes in the erythrocytes, and these cells are subsequently rapidly destroyed, with the production of hemoglobinemia and hemoglobinuria.

Toxic Hemoglobinurias

Any toxin or process that destroys erythrocytes rapidly enough produces hemoglobinemia and hemoglobinuria. Thus, hemoglobinuria is occasionally seen in almost any type of acute hemolytic anemia. The number of toxic agents that are hemolytic is large, and only a few of the commonly encountered ones will be mentioned.

One of the unfortunate aspects of the sulfonamide drugs is the frequency with which they produce acute hemolytic anemia. Sulfanilamide is the most frequent cause of hemolytic anemia, but all the other sulfonamides have also been incriminated. The hemolytic process has been so severe in 20 per cent of these cases that hemoglobinuria has resulted, and of the patients developing hemoglobinuria approximately 15 per cent have died.

The mechanism by which the sulfonamides produce hemolysis is not clear. Osmotic fragility

changes have been detected in cases that were studied early in the course of the acute hemolytic process.[134–137] In other cases abnormal hemagglutinins have been demonstrated,[134, 135, 138, 139] but these may have been produced by the underlying disease process rather than by the sulfonamide itself. How sulfonamides produce osmotic fragility changes or abnormal hemagglutinins and what part these abnormalities play in the production of the hemolytic process are unknown.

Hemoglobinuria practically very rarely occurs in familial hemolytic jaundice, even during acute crises with massive blood destruction. It is probable that the reticuloendothelial system is continually hyperactive in these cases and is therefore able to metabolize erythrocytic breakdown products readily in times of acute hemolysis. Hemoglobin occasionally appears in the urine in acute hemolytic anemia of the acquired type, and isohemolysins have been demonstrated in the serums of some of these patients.[140]

Quinine taken in extremely large doses as an abortifacient has produced fatal hemolytic anemia, with hemoglobinuria, in 10 cases.[141, 142] How quinine causes hemolytic anemia is poorly understood. Studies by Ponder and Abels[143] have shown that it exerts a hemolytic effect in vitro only in concentrations that are far in excess of therapeutic blood levels. It is unlikely that even the large doses taken by patients who have died produced blood levels sufficiently high to cause hemolysis. An abnormal susceptibility of the erythrocytes of pregnant women to hemolysis by quinine has been postulated,[141] but this has never been demonstrated and seems improbable.

The bites of certain snakes[144, 145] and spiders[146] produce increased osmotic fragility, rapid intravascular hemolysis and massive hemoglobinuria as a result of the direct chemical action of the venom on the lipids of the red cell. A similar lytic effect of the toxin of *Clostridium welchii* probably accounts for the hemolytic anemia and hemoglobinuria of such infections.

Arsine (arseniuretted hydrogen) is a highly toxic gas that produces extreme intravascular hemolysis, profound anemia, methemoglobinemia, hemoglobinemia and hemoglobinuria. It is not used industrially but may be generated inadvertently in any process in which an acid or a metal, either or both of which contain arsenic, are brought into contact, with the resultant evolution of nascent hydrogen and the interaction of the hydrogen and arsenic to form the gas. Acute poisoning has occurred most frequently in chemical laboratories, galvanizing plants, submarines (from arsenic in lead storage-battery plates), ships carrying ferrosilicon and factories that manufacture hydrogen gas from zinc.[147] Three cases occurring in laborers unloading fish-scrap fertilizer from the holds of ships have recently been reported.[148] Arsine has two effects on the blood. It rapidly produces methemoglobin and more slowly is metabolized to some as yet unidentified compound that produces extreme intravascular hemolysis. A latent period varying from a few hours to two days may follow inhalation of the gas before the hemolytic process begins. Once started, however, hemolysis may progress so rapidly that death from anemia occurs within a few hours. In patients surviving the acute hemolytic phase, posthemoglobinuric anuria sometimes develops and death may result from renal failure and uremia.[148, 149]

Hemoglobin must remain in its normal intraerythrocytic position if health and normal body function are to be maintained. Although capable of transporting oxygen and of sustaining life when in solution in the plasma,[150, 151] the escape of large quantities of hemoglobin from erythrocytes into the plasma is almost invariably followed by adverse symptoms and hemoglobinuria and frequently by death. Red or black urine, the danger signal indicating extensive intravascular hemolysis, must always be taken seriously, its cause determined and appropriate therapeutic measures immediately instituted.

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MASSACHUSETTS MEDICAL SOCIETY

PROCEEDINGS OF THE COUNCIL

Stated Meeting, October 3, 1945

A STATED meeting of the Council was called to order by the president, Dr. Reginald Fitz, Suffolk, on Wednesday, October 3, 1945, at 10:30 a.m., in John Ware Hall, 8 Fenway, Boston. The secretary, Dr. Michael A. Tighe, Middlesex North, served as recorder; 211 councilors (Appendix No. 1) were present.

In opening the meeting the President read the following obituary:

It is the President's sad duty to open this meeting by reporting the death of Philemon Edwards Truesdale, a councilor from the Bristol South District and for several years a member of the Committee on Cancer. He died at Fall River on June 12, in his seventy-first year.

Dr. Truesdale received his degree from the Harvard Medical School in 1898, soon entered practice in Fall River and became a nationally known surgeon as director and founder of the Truesdale Hospital. He joined the medical corps of the United States Army in 1917 and sailed for France with the rank of captain in the Yale Mobile Hospital Unit. In October 1918, he was promoted to the rank of major. On his return to the United States he was made director of surgery at Camp Devens and was honorably discharged from the Army on March 15, 1919.

He became a fellow of the Massachusetts Medical Society in 1903 and was president of the Bristol South District Medical Society from 1927 to 1928. He was vice-president of the Massachusetts Medical Society from 1933 to 1935 and one of our alternate members in the House of Delegates of the American Medical Association from 1929 to 1937.

Besides being a member of the Massachusetts Medical Society and of the American Medical Association, Dr. Truesdale was a member of the American Association for Thoracic Surgery, the American College of Surgeons, the American Hospital Association, the American Surgical Society, the Fall River Medical Society, the International Surgical Society, the New England Cancer Society and the New England Surgical Society.

Dr. Truesdale is survived by his widow, three sons and four daughters.

In accordance with the President's expressed wish, the Council stood in silent respect to the memory of Dr. Truesdale.

Dr. Fitz addressed the Council as follows:

Our by-laws state that the president shall preside at the meetings of the Council. The rules of the Council specify that new business offered at any meeting shall be referred to an appropriate committee before any action is taken on it; and also that committee reports shall be referred to the Executive Committee for consideration before any action is taken on them.

The President believes that these two rules are of great significance. They are designed to prevent impetuous action by the Society's deliberative body. Moreover, they create, in effect, a reference committee by which resolutions, measures and propositions to be presented to the Council by any of its committees shall first be filtered through a small and representative group of its members elected for such service by their district societies.

In presiding at today's meeting, the President will invite the chairman of each committee which has expressed intention of reporting to render its report. In case any chairman is not a member of the Council, the President, with the permission of the Council, will offer him the privileges of the floor. After the report has been accepted, the President will present the Executive Committee's views on it and will then state the question concerned in the report as clearly as he can. It then comes before the assembly for debate and action.

The President reminds the Council that Robert's *Rules of Order* govern our deliberations when not in conflict with our by-laws. This authority states that debate must be limited to the merits of the immediately pending question; and that no member can speak a second time to a question so long as any member desires to speak who has not spoken the question. The President asks each councilor who obtains the floor to announce his name and his district society before speaking and to speak from the desk so that his remarks can be easily heard by all in attendance. In addition no motion should be discussed until it is seconded.

Reports of Committees

Executive Committee — Dr. Michael A. Tighe, Middlesex North, secretary.

In presenting this report (Appendix No. 2) the Secretary said that the Executive Committee had met three times since it last reported to the Council. The meeting held on May 23, 1945, was in lieu of the annual meeting of the Council, the wartime restrictions imposed by the Office of Defense Transportation having made this latter meeting impossible.

The second meeting, he said, was of an emergency character and had to do with two items of business which were of pressing importance. The first was concerned with a fee schedule (Appendix No. 3) which the Society had been asked to set up by the Massachusetts Department of Education, Division of Rehabilitation. He added that this schedule was submitted by the Committee on Rehabilitation — Dr. Joseph H. Shortell, Suffolk, chairman, — its purpose being to act as a guide in the payment for medical services rendered to those covered by the rehabilitation program. He said that those coming within the scope of this program need not show indigence but must be without the means of paying for these services themselves. He added that it was hoped by the rehabilitation program to restore those with remediable and static difficulties to their full economic value to the community.

The Secretary said that the Executive Committee approved this schedule in the name of the Council. He noted that Dr. Richard Dutton, Middlesex East, was recorded as disapproving.

He moved that the Council approve this act of the Executive Committee. This motion was seconded by Dr. Walter G. Phippen, Essex South.

Dr. Allan M. Butler, Suffolk, was recognized by the chair. He called attention to the following four charges which to him seemed unfortunate: hemoglobin (Sahli), $2.00; sedimentation rate, $5.00; hematocrit, $3.00; serum nonprotein nitrogen, $3.00; and serum chloride, $3.00. He said that he wished to emphasize the point that the last two determinations were relatively simple and that an inexperienced technician in a laboratory could carry out

forty of them a day. Dr. George L. Schadt, Hampden, asked Dr. Butler if he considered the fees in this schedule too high. Dr. Butler responded that he did not so consider all of them. Dr. Schadt said that Dr. Butler's claim might be so as it related to the larger laboratories but that it was not so in the smaller private laboratories. He expressed the thought that on the whole the fees for laboratory work as set forth in the schedule were adequate and equitable.

The motion was carried by vote of the Council.

The Secretary said that the second item of business considered at this emergency meeting of the Executive Committee had to do with a request which came from the Society's delegates to the Council of the State Medical Societies of New England that $100 be contributed by the Society toward defraying the expenses of this council. He said that the Executive Committee approved of this request. He moved that the Council approve this act of the Executive Committee. This motion was seconded by Dr. Allen G. Rice, Hampden, and it was so ordered by vote of the Council.

The Secretary said that the third or pre-Council meeting of the Executive Committee was held on September 26, 1945, and that the committee reviewed all the committee reports that appeared on the agenda being considered by the Council. He said that the committee recommended that the reports that were purely informational be accepted and that, in the case of those that contained recommendations, the recommendations be adopted with one exception, namely, that, in the case of the report of the Committee Appointed to Study a Possible Revision of the By-laws as They Relate to the Election of Fellows, the Executive Committee recommended that the words "if possible" appearing in Recommendation No. 2 be deleted and that the word "may" be inserted between the word committee and the word "be" appearing in the same recommendation. He said that action on this recommendation would be sought when the report of this committee was before the Council for action.

The Secretary said that the Executive Committee noted the withdrawal of the report of the Subcommittee on Public Information and likewise the withdrawal of Recommendations No. 1 and 2, which appeared in the supplementary report of the Committee on Postwar Planning. He said that the Executive Committee approved a resolution submitted jointly by the Committee on Public Relations, Committee on Legislation and Committee on Postwar Planning. He added that this resolution represented an attempt to meet in the person of one individual the needs of the Society as seen by these committees. This resolution, he continued, would be formally before the Council later in the meeting.

The Secretary said that the Executive Committee had approved of the President's act in appointing two fellows of the Society to attend, at the Society's expense, a conference on public relations in Chicago, which was to be held under the auspices of the Council on Medical Service and Public Relations of the American Medical Association. He moved that the Council do likewise. This motion was seconded by a councilor, and it was so ordered by vote of the Council.

The Secretary read a list (Appendix No. 2) of ad interim appointments made by the President. He said that the Executive Committee had approved these appointments and moved that the Council do likewise. This motion was seconded by Dr. Albert A. Hornor, Suffolk, and it was so ordered by vote of the Council.

He spoke of a communication that had been received from the Committee on Rural Medical Service of the American Medical Association and said that when this communication was formally before the Council the committee would recommend that the President be directed to appoint a committee of three to confer with a committee of the Massachusetts Farm Bureau Federation concerning rural medical service.

The Secretary moved the adoption of the report as a whole. This motion was seconded by Dr. William M. Collins, Middlesex North, and it was so ordered by vote of the Council.

Committee on Finance — Dr. Francis C. Hall, Suffolk, chairman.

Dr. Hall reported as follows:

> The only things that the Finance Committee has done since the last report are to approve the budget of $1000 for a Committee on Public Information, under Dr. Fallon, and to approve the activation of a postwar loan fund, which called for no appropriation.

Dr. David Cheever, Suffolk, moved the acceptance of the report. This motion was seconded by Dr. Leroy E. Parkins, Suffolk, and it was so ordered by vote of the Council.

The President said that this report contained two recommendations: one that had to do with confirming the committee's action in approving an appropriation of $1000 for the Subcommittee on Public Information and the other its action in approving the activation of a postwar loan fund.

Dr. Phippen moved their acceptance. This motion was seconded by Dr. Rice and it was so ordered by vote of the Council.

Committee on Arrangements — Dr. Roy J. Heffernan, Norfolk, chairman.

The report, which is as follows, was offered by the chairman:

> A meeting of the committee was held on August 29. It is recommended that the annual meeting be held in Boston on May 21, 22 and 23, 1946. Space has been reserved at the Hotel Statler for these dates.

Dr. Heffernan moved the acceptance of the report. This motion was seconded by Dr. Peirce H. Leavitt, Plymouth, and it was so ordered by vote of the Council.

The President said that the report contained one recommendation that had to do with the time and place of the annual meeting. He added that this recommendation had been approved by the Executive Committee. It was regularly moved and seconded that the recommendation be adopted, and it was so ordered by vote of the Council.

Committee on Legislation — Dr. William E. Browne, Suffolk, chairman.

This report (Appendix No. 4) was offered by the chairman as published in the circular of advance information. It reviewed the work of the committee during the 1945 legislative session. It said that the committee had acted upon nineteen bills in the Senate and fifty-one bills in the House. It recorded the resignation of Dr. Browne as chairman and the election of Dr. Humphrey L. McCarthy, Norfolk, in his place.

It paid tribute to the efforts of Dr. H. Quimby Gallupe, secretary of the State Board of Registration in Medicine, to Dr. Vlado A. Getting, Commissioner of Public Health, to the officers of the Society, to the efforts of certain district societies, noting that, in some of these, action had been feeble, and, finally, to certain members of the Senate and House.

This report also included Governor Tobin's message that accompanied his veto of the Chiropractic Bill.

It was moved by Dr. Browne and seconded by Dr. Hornor that the report be accepted. It was so ordered by vote of the Council.

The President noted that this report contained the following recommendation:

> That a column be printed from time to time, as indicated, in the *New England Journal of Medicine* which shall be devoted to legislative affairs and which shall be prepared by the chairman of the Committee on Legislation.

It was moved and seconded that this recommendation be adopted, and it was so ordered by vote of the Council. (Dr. Browne left the platform amid applause.)

Committee on Public Relations — Dr. Albert A. Hornor, Suffolk, secretary.

This report, which is as follows, was offered by Dr. Hornor:

> The Committee on Public Relations of the Massachusetts Medical Society met on August 1 at the Harvard Club; at this meeting there were present ten members of the committee. There was no action taken which will require confirmation or approval by the Executive Committee.
>
> Progress reports were made by several committees. A report of the Subcommittee on Public Information was made by Dr. John Fallon. Dr. Daniel Reardon reported on the Subcommittee on Labor and Industry. Dr. Howard F. Root made a report on the Committee on Postwar Planning and on the Subcommittee on Postgraduate Education. Dr. William E. Browne made an informal report on the Committee on Legislation. Dr. Hornor, in the absence of Dr. John Dumphy, made a report on the Subcommittee on Tax-Supported Medical Care.

Dr. Hornor moved the acceptance of the report. This motion was seconded by Dr. Phippen, and it was so ordered by vote of the Council.

Subcommittee on Labor and Industry — Dr. Daniel B. Reardon, Norfolk South, chairman.

This report, which is as follows, was offered by Dr. Reardon:

> During the past year, your committee has had three meetings, two with representatives of the two major groups of organized labor, and one meeting with members of the Associated Industries of Massachusetts. At all these meetings the important question which was discussed was medical-care costs to the working man and what means should be established to meet these costs.
>
> Although the discussion at these meetings consumed about two hours, your committee was informed that labor has definite ideas as to how this cost should be met, and also that the representatives of industry have some ideas about this same question. The important facts brought out at these meetings are as follows:
>
> 1. The C.I.O. representatives expressed themselves in favor of "adequate medical care at the price the worker is able to pay."
>
> 2. The A. F. of L. representatives stated that in their opinion the demand should be met by an insurance plan, the entire cost of which should be borne by industry.
>
> 3. The representatives of industry stated that it was their opinion that the entire cost of medical care could not be borne by industry at this time, because it would place an additional cost on production, thus making their production costs higher than their competitors in other states, who did not have the same coverage. They also brought to the front two phases of the problem, namely, medical-care costs, and loss of income to the employee during illness. Although they stated that they had no definite answer as yet to the medical-care costs, they felt that the question of loss of income during illness was a social and economic problem and should probably best be provided by state or national legislation.
>
> Both industry and labor representatives did not endorse any scheme such as compulsory health insurance. Labor objected on the grounds that it would mean an additional contribution from labor to pay the costs, and industry objected to such legislation because it would mean state or national medical supervision.
>
> Since we have held our meetings, it has been brought to our attention that some industrial concerns have adopted a comprehensive insurance plan with extensive coverage for their employees. Whether or not this plan will be taken up by other industries, we cannot state at the present time.
>
> In exploring this field, your committee believes that it has obtained the opinions of labor and industry relative to medical-care costs as expressed by them in good faith. This is only a beginning; future conferences may solve the answer to this perplexing problem.

Dr. Reardon moved the acceptance of the report. This motion was seconded by Dr. Guy L. Richardson, Essex North, and it was so ordered by vote of the Council.

Other Standing Committees

The President announced that, although the following standing committees had reported during the year as provided for in the by-laws, they offered no reports on this occasion: Ethics and Discipline, Industrial Health, Medical Defense,

Medical Education, Publications, Public Health and Society Headquarters. He likewise announced that the Committee on Membership had reported to the Executive Committee on those matters which according to the by-laws have their final action in the latter committee. He added that the Committee on Membership had no additional report. On a motion by Dr. Richard M. Smith, Suffolk, and a second by Dr. Leavitt, it was voted to accept a report of "no report" from the above-mentioned committees.

Committee on Postwar Loan Fund — Dr. George Leonard Schadt, Hampden, chairman.

Dr. Schadt offered the following report:

> Your committee has had several fully attended meetings, and has discussed in considerable detail the plan to be followed in activating the work of the committee. Dr. Eliot Hubbard, Jr., treasurer of the Society and a member of the committee, and Mr. Robert St. B. Boyd, executive secretary, have, at the request of the committee, had many conferences with a number of commercial and federal-reserve bank officials, and Dr. Tighe, Dr. Hubbard, Mr. Boyd and your chairman have had a most interesting and valuable conference with Mr. Wallace, State Commissioner of Banking.
>
> As a result of these various conferences and after considerable discussion, the committee wishes to report as follows:
>
> > It is the opinion of the Committee on Postwar Loan Fund that the proper way to handle loans under the fund is through the instrumentality of a commercial bank, the contribution of the Massachusetts Medical Society being the guaranteeing of the loan and the absorption of the difference in interest between the amount actually charged for the borrowed money and the 2 per cent paid by the member borrowing under this loan.
>
> This opinion was arrived at unanimously, since it became evident to the committee that there were many complicated elements entering into making loans of this kind and that these complications were largely the result of Government regulations and restrictions. This made the business at hand a strictly banking procedure; and because we did not possess in our organization the skills required, it was thought wise to turn the actual business details of such loans over to a bank. The committee, in submitting this report, recommends:
>
> > That it be permitted to activate the work of the Committee on Postwar Loan Fund within the framework as outlined above, rather than as voted by the Executive Committee acting for the Council at the meeting in May, at which time the committee was authorized to function on the premise that only 2 per cent or less should be paid by the member borrowing under the loan. The present plan retains this feature, namely, that the member shall pay only 2 per cent, the added interest being assumed by the Massachusetts Medical Society.

Dr. Schadt moved the acceptance of the report. This motion was seconded by Dr. Phippen.

Dr. Cheever inquired how many returned veterans had sought the assistance of the Massachusetts Medical Society. Dr. Schadt replied, "Ten." He explained the small number by saying that no publicity could be given to this matter until the Council had taken action on it.

The motion was adopted by vote of the Council.

The President pointed out that this report contained two recommendations. First, that the action of the Executive Committee on May 23, 1945, in approving that part of the report of the Committee on Postwar Loan Fund that had to do with certain administrative details be rescinded and, secondly, that the fund created under this auspice be administered through a loan from such commercial bank or banks as the committee, with the approval of the Treasurer, may select, the Society guaranteeing the principal of the loan and absorbing the difference in the interest charged by the bank or banks and the 2 per cent that will be paid by the individual borrower.

At the suggestion of Dr. Donald Munro, Suffolk, the President called for action on the second recommendation. A motion to adopt this recommendation was offered by Dr. Edward P. Bagg, Hampden. This motion was seconded by Dr. Phippen.

Dr. Munro pointed out that as the administrative detail is set up in this recommendation there is no limit set concerning the total amount of interest that will be charged by the bank in any particular loan. He expressed it as his opinion that such limits should be set forth in the recommendation itself.

Dr. Eliot Hubbard, Jr., treasurer, explained that, although it was true that a limit for the total interest rate that the banks might charge was not set forth in the recommendation, an agreement had already been reached with a bank whereby this total rate would be 5 per cent — the individual obtaining the loan paying 2 per cent, and the Society 3 per cent.

Dr. Munro, in reiterating his belief that the limits as set forth by Dr. Hubbard should be incorporated in the recommendation, moved to amend the recommendation by adding to the next to the last line the words "not to exceed 3 per cent." In its amended form, he said, this last sentence of this recommendation would read as follows:

> The present plan retains this feature, namely, that the member shall pay only 2 per cent, the added interest, not to exceed 3 per cent, being assumed by the Massachusetts Medical Society.

This amendment was seconded by a councilor.

Dr. Schadt expressed himself as being in accord with the amendment. It was apparently also agreeable to the maker of the motion and its seconder.

Dr. Parkins inquired how long the postwar loan fund would be available, and Dr. Reardon asked the Treasurer to clarify the question of loans and the Society's ability to pay them, saying that the latter had given information of this character to the Executive Committee. Dr. Hubbard responded as follows:

> The Society takes the $25,000 that has been authorized to work with and puts it up as collateral with the commercial bank. The commercial bank makes loans to the applying member. The commercial bank will charge 5 per cent for this service. Therefore, the Society will have to take on 3 per cent of that charge in the plan as outlined here.

Dr. William F. Ryan, Middlesex North, suggested that the Treasurer tell the Council of the difficulties

attending small-loan banking. Dr. Reardon also asked for this information. Dr. Schadt took the question and answered as follows:

> The committee appointed by the President, consisting of Dr. Hubbard, the treasurer, Dr. Tighe, the secretary, Dr. Parkhurst, Dr. Lund and myself have had many meetings. We studied this whole problem, and then we had a meeting with Mr. Wallace, State Commissioner of Banking. Mr. Wallace brought to our attention in our first meeting the difficulties that would arise as a result of Schedule W, as promulgated by the Government with reference to borrowing moneys for certain equipment, and Mr. Wallace was very strongly of the opinion that the better way of running this fund was to do it through a commercial bank, using the $25,000 of the Society, in bonds or stocks as collateral against the money that would be borrowed by the members of the Society.
>
> He pointed out that it would cost 5 per cent, that there would be certain work that the bank would have to do, which would be covered by the 5 per cent, and that we could stick to the 2 per cent if we wished, paying the difference to the bank, or that later, when the committee talked it over, we could ask the returning veteran to pay the whole 5 per cent.
>
> In a later meeting the committee unanimously agreed that the better plan would be to stick to the 2 per cent that we were going to charge our returning members and that the Society should pay the difference.
>
> Just remember that the $25,000 that the Society has allocated to this work is in bonds and stocks, and will be kept that way. The bonds will simply be put up as collateral. We still get interest on those bonds at 2½ per cent, amounting to $750. When the receipt of this interest is taken into consideration it will be found that the Society's income, by reason of this loan, will suffer to the extent of $125.

Dr. Hubbard said in response to a question by Dr. James C. McCann, Worcester, that the amount borrowed could be up to $25,000, the amount represented by the collateral put up by the Society. He added that a total of fifty loans of $500 each would thus be available. He also said that, if the Society assumed the payment of 3 of the 5 per cent to be charged on these loans, as proposed in this plan, the Society would escape practically all administrative expense and that probably it would be found that one would balance the other.

In answer to a question by Dr. Richardson, Dr. Schadt said that the Society guaranteed both the principal and interest. Dr. Richardson asked if the Society could not simply issue a note to the bank in the sum of $25,000 without putting up collateral. Dr. Hubbard said that the collateral is required.

Dr. Walter H. Pulsifer, Plymouth, asked if the total number of $500 loans available under this fund would be 50. Dr. Schadt replied in the affirmative.

Dr. Harold G. Giddings, Middlesex South, asked how long the loans would run, whether they could be renewed and what was the limit in amount of the individual loan. Dr. Schadt said that the limit was $500 per loan, that it was payable in a year and that it might be renewed. He added that further extension of the amount of the fund was a subject for future decision by the Council.

In response to a question by Dr. Leavitt, Dr. Hubbard said he was sure he could obtain the money at a total rate of 5 per cent.

Dr. Rice asked if the individual loan was discounted at the start. Dr. Hubbard replied in the affirmative.

The motion as amended was adopted by vote of the Council.

Dr. Edward P. Bagg, Hampden, moved the adoption of the first recommendation, which would rescind the action of the Executive Committee of May 23, 1945, concerning the administration of this fund. This motion was seconded by Dr. Phippen, and it was so ordered by vote of the Council.

The report as a whole, as amended, was adopted by vote of the Council.

Committee on Postwar Planning — Dr. Howard F. Root, Suffolk, chairman.

This report (Appendix No. 5) was offered by Dr. Root. In offering the report Dr. Root spoke as follows:

> This week the *Journal of the American Medical Association* has provided the present new up-to-date list of residencies now available throughout the United States. Many of you have probably seen this; the figures are rather striking.
>
> In Massachusetts there are 80, of which nearly all are provided by a very small number of institutions. New York City, with 115, is providing the largest number of residencies and fellowships. Boston is next, and Chicago has 65. But the fact is that the Commonwealth of Massachusetts is really indebted to a very small number of institutions for the provision of this number of opportunities, and certainly this report, which will interest everyone, indicates the need for us to do more rather than less.

Dr. Root moved the acceptance of the report. This motion was seconded by Dr. Rice, and it was so ordered by vote of the Council.

A supplementary report of his committee was offered by Dr. Root as follows:

> The Committee on Postwar Planning recommends: (1) That the Council approve the appointment of a full-time director of medical education who shall be a physician. (2) That the Council authorize the President to appoint a committee to secure such a director of medical education. (3) That the Council approve a supplementary budget for the use of the Subcommittee on Postgraduate Education for the balance of 1945 as follows: Clinical Information Bureau and office expense and wages, $1000, and for payment of instructors and incidental expenses in providing postgraduate instruction in ten or twelve localities this fall, $1500, a total of $2500.

Dr. Root announced that the first and second recommendations had been withdrawn by his committee. He moved the adoption of the third recommendation. This motion was seconded by Dr. Phippen. The Secretary announced that the Committee on Finance had approved the expenditure called for in this recommendation.

Dr. Schadt said:

> I had the impression that most of this course, or much of it, was to be given by the Government or by the State Department of Public Health and that considerable, if not all, of the expense was to be borne by them. I am rather surprised to hear that the Society is now asked to add $1500 to the budget of this committee for the payment of instructors. I thought that the Government and

the State Department of Public Health, in putting on their program of child welfare and maternity work, were to furnish the instructors and pay them. Am I mistaken?

Dr. Root replied that Dr. Schadt was mistaken in his assumption and that, although it was true that the Commonwealth would contribute to the program, it would not finance it in its entirety. In reply to a further question by Dr. Schadt, Dr. Root said that he did not know how much the state contribution would be. He referred Dr. Schadt to Dr. Ohler, chairman of the subcommittee having this work in hand.

The motion to adopt the recommendation was passed by vote of the Council.

Committee on Public Relations, Committee on Legislation and Committee on Postwar Planning

At the direction of the President, the Secretary read a joint report and resolution offered by these committees as follows:

There is need for the Massachusetts Medical Society to express to a wide audience its opinion on matters of public health. Better relations between the public and the Society than now exist are urgently needed. Our experience in postgraduate medical education, information and legislation has already made it plain that we can be of greater use to our members and the public than heretofore.

We believe that the Society, as a vehicle of education, is under an obligation to offer its opinion on medical affairs to the public in an honest, intelligent and ethical manner.

The task entailed in organizing and activating means to make the various educational facilities of the Society of greatest possible value to physicians and the public is large. We recommend that a new position in the Society be created — that of Director of Medical Information and Education. The incumbent should, if possible, be a physician well enough known by the members at large so as to have their confidence; he should have sufficient energy, zeal and imagination to be able to develop the duties of such a post successfully.

Since the position would be of major importance to the welfare of the Society, the incumbent should be appointed by the Council on proposal by a committee of seven named by the President.

The by-laws state that the Council shall vote the salaries of its employees; the level of such a director's salary, therefore, would be a matter for Council decision. In order to attract a physician to this post, we suggest that the honorarium offered must be in line with full-time salaries paid to physicians in Massachusetts who occupy our most responsible positions in medical education and administration. No candidate who promised success in this post could be attracted to it on any other basis. We therefore present the following resolution:

RESOLUTION

WHEREAS, We consider that the Massachusetts Medical Society is under obligation to make its educational facilities of increasing usefulness to fellows, to all licensed physicians in Massachusetts and to the public; therefore, be it

RESOLVED, That the Massachusetts Medical Society hereby creates a new position, its holder to be known as the Director of Medical Information and Education, charged with the duty of promoting in an ethical manner the educational usefulness of the Society to its fellows, to all licensed physicians in Massachusetts and to the public, and also charged with the performance of such other duties as the Society or the Council may require.

Dr. John Fallon, Worcester, moved the acceptance of this report. This motion was seconded by Dr. Phippen, and it was so ordered by vote of the Council.

The President announced that the resolution provided that the Massachusetts Medical Society should create a new position, its holder to be known as the Director of Medical Information and Education and charged with the duties specified in the resolution.

Dr. Fallon moved the adoption of the resolution. This motion was seconded by Dr. Leavitt.

Dr. Fallon said that it had become increasingly apparent to those in intimate contact with the Society's affairs that the handling of its approach to the public was being inefficiently done. He added that this was a specialized field which required specialized training, a type of training that the busy practitioner usually did not possess and had little interest in possessing. "All of us believe," continued Dr. Fallon, "that this man, preferably a doctor, should have a full-time job here at headquarters. He would be the fellow who would have time to sit down and study all day and tell the rest of us what we need to know of newly proposed matters having to do with the health of the people."

Dr. William A. R. Chapin, Hampden, urged speedy action on this matter.

Dr. Charles J. Kickham, Norfolk, thought that the Society should proceed with caution and deliberation. He believed that the committee appointed under this resolution should not be rushed and that it should have plenty of time to canvass for the proper incumbent. He expressed some uncertainty about the medical-education phase of this resolution, adding that the Society had a comparatively limited educational program. He said that it was his conception that this new position represented a means of getting the Society's ideas concerning health matters over to the public and to those in the service of the public. Dr. Kickham offered two suggestions to the committee, if and when it was appointed under this resolution: first, that the committee submit not one name but several with the candidates' respective qualifications fully set forth, and secondly, that the person finally selected perform his duties under the direction of the Secretary. He stressed this point particularly in the event that a layman was chosen.

Dr. Root said that he thought that the members of the Society would want a man in this position who was interested not only in the education of the public but likewise in the scientific education of the members. He thought that it would not be too difficult to obtain a physician for the job and that the job itself would offer a real opportunity to a physician with ability along these lines. This man, he continued, would do a public-relations job and would find himself in a position where his imagination and usefulness could be great.

Dr. Cheever referred to the largeness of the order involved in the proposed action. He pointed out that the preamble to the resolution said that it was

intended to pay the person selected an honorarium equal to the full-time salaries paid to physicians in Massachusetts who occupy most responsible positions. He presumed that this would mean anywhere from $10,000 to $15,000 per year. He added that these were large sums and that the need and usefulness of such a step must be clearly defined. He said that he thoroughly agreed with Dr. Fallon concerning the need of a competent person to guide the Society in its public approach. He added, however, that there were too many generalities in the preamble that ought to be defined. He asked what was meant by the following: "The task entailed in organizing and activating means to make the various educational facilities of the Society of the greatest possible value to physicians and the public at large." In this connection he asked what were the facilities of the Massachusetts Medical Society. He said that he regarded these facilities as being represented by the brains of the various members of the Society. He urged support of the Boston Medical Library. Finally, he cautioned the members to proceed slowly before committing themselves to the expenditure of the very considerable sum involved.

Dr. Elmer S. Bagnall, Essex North, said that this subject had been under discussion for fifteen years. He expressed himself as believing that anyone who has presided over the destinies of the Society soon becomes aware of the necessity of having a full-time officer who could focus the thinking and functions of the Society in the interest of the community and of the profession at large. He pointed out that, by comparison with certain other states, the dues of $10.00 per year were small and that, if it is necessary, they could be increased. He thought that the proper person could be found for the job.

Dr. Phippen said that he would like to speak on the issue raised by Dr. Cheever. He said that he was very much interested in utilizing the educational possibilities of the small hospitals of the state. He pointed out that, outside certain teaching centers, there were extremely few hospitals equipped to handle residencies. A person trained in this work, he added, could supply the inspiration and help necessary to make realities out of these possibilities. In expressing agreement with Dr. Cheever that there should be a more widespread use of the Boston Medical Library, he said that such a director would be in a splendid position to bring home to the small hospital and its staff the value of the library. He expressed the hope that the resolution would prevail.

At that point the Council went into executive session.

The Council rose out of executive session at 1:15 p.m.

At the request of the President, the Secretary reread the joint resolution whose adoption had been moved and seconded before the Council went into executive session.

Dr. Hornor moved, as an amendment, the adoption of the resolution provided that the following sentence be added to it: "Such a director of medical information and education shall be appointed by the Council on proposal by a committee of seven named by the President." This amendment was seconded by Dr. Root. (The amendment put into the resolution a provision specified in the preamble.) The amendment was adopted by vote of the Council.

Dr. Fallon moved the adoption of the resolution as amended. This motion was seconded by Dr. Leavitt, and it was so ordered by vote of the Council.

Committee Appointed to Study a Possible Revision of the By-laws as They Relate to the Election of Fellows — Dr. Charles J. Kickham, Norfolk, chairman.

This report (Appendix No. 6) was offered by Dr. Kickham, who referred to the report as printed in the circular of advance information.

He said that the Executive Committee recommended that the words "if possible" as appearing in the second recommendation be deleted and that the word "may" be inserted between the word "committee" and the word "be," likewise as appearing in the second recommendation.

He moved the acceptance of the report subject to these changes. This motion was seconded by Dr. Phippen, and it was so ordered by vote of the Council.

The adoption of the recommendations contained in the report, subject to the changes noted by Dr. Kickham, was moved by Dr. Leavitt. This motion was seconded by Dr. Richardson. The recommendations as amended are as follows:

(1) That letters recommending candidates from non-approved or foreign medical schools be definitely detailed, specific and informative in regard to the applicant.

(2) That an officer of the district society or a member of the district membership committee may be present at the deliberations of the State Committee on Membership when applicants from their district are under consideration.

(3) That the State Committee on Membership, acting within the by-laws, invite an officer of the district society or a member of the district committee on membership to review with them the record of an applicant before final decision of disapproval of such an applicant is made.

Their adoption was ordered by vote of the Council.

Dr. Kickham moved the adoption of the report as a whole as amended. This motion was seconded by a councilor, and it was so ordered by vote of the Council.

Medical Advisory Committee to Regional OPA — Dr. Joseph Garland, Suffolk, chairman.

This report, which is as follows, was offered by the Secretary in the absence of Dr. Garland.

Certain changes have taken place in food rationing, which, it is hoped, will expedite the work of your com-

mittee, as well as that of the OPA Regional Office, so ably managed by Miss Elizabeth Golden, the food rationing specialist of that office.

Rations for service men on convalescent furloughs are now issued by five military rationing boards in New England, and the medical problems of members of the armed forces will from now on be handled by service doctors.

Local rationing boards have also been authorized to approve automatically the medical applications filed by repatriated civilian prisoners of war, and by veterans discharged because of illness resulting from imprisonment.

This committee has always issued extra rations according to its own views, guided by the best advice available, regardless of whether cases fell outside of the narrow list of diseases prescribed by the National Research Council, and it is a source of satisfaction that the latter has recently given an opinion that medical committees should function according to their own experience.

This committee has always recognized the possible need of extra rations after hemorrhage or with anemia of any type below certain hemoglobin and red-blood-count levels, with various types of allergy, and, indeed, wherever a need could be shown to exist regardless of diagnosis. Thus, the need for extra protein in the later months of pregnancy has been demonstrated, as has also the efficacy of the Schemm diet in certain forms of heart disease.

Local advisory committees are now functioning in Brookline, and, through the good offices of Dr. Guy Richardson, chairman of the War Participation Committee, in Brockton, Scituate, Lawrence, Pittsfield, Springfield, New Bedford, Worcester, Holyoke, Quincy and Lowell.

The work of the Regional Office continues, nevertheless, to increase. Thus, in April, 1305 cases were processed; in May, 1322; in June, 1499. Something under half of these applications seem to merit approval. Cases from outside Massachusetts increased from 17 in May to 131 in June, mostly from Vermont, which seems to prefer the advice of the Massachusetts committee to the appointment of a committee of its own.

The ending of the war has produced marked changes in the food rationing program — processed foods are no longer rationed, the rationing of meats and fats has been relaxed, and there is promise of an early ending of all food rationing except that of sugar.

Your committee hopes that its duties will cease within the next few weeks; in the meantime, meat, fat and sugar rationing render a continued oversight necessary.

This report is offered for the information of the Council.

The Secretary moved the adoption of the report. This motion was seconded by Dr. Chapin, and it was so ordered by vote of the Council.

War Participation Committee — Dr. Guy L. Richardson, Essex North, chairman.

Dr. Richardson submitted the following report:

Since our last report, physicians' committees to assist the rationing boards in Holyoke and Quincy have been organized.

The only other matter of importance was a request from the Division of Employment Security of Massachusetts to approve a certificate form for veterans' disability, and to assist them by reviewing any questionable certificate. The certificate form presented was approved, and the committee voted to review any such certificate referred to us. This is the same procedure followed in the case of doctors' certificates for change of job, handled by the War Manpower Commission.

With the war over, this committee asks for its discharge.

Dr. Richardson moved the acceptance of the report. This motion was seconded by Dr. Collins, and it was so ordered by vote of the Council.

Dr. Fitz said that this report contained one recommendation, namely, that the committee be discharged. It was moved and seconded that this recommendation be adopted and that this motion include an expression of gratitude from the Society to the members of the committee for having contributed so valuably to the war effort. It was so ordered by vote of the Council.

Military Postgraduate Committee — Dr. W. Richard Ohler, Norfolk, chairman.

Dr. Ohler offered the following report:

Since last February, programs have been conducted as usual. Seventy-nine meetings have been held at eighteen installations scattered through New England.

Up until the present moment, no final decision has been made regarding the termination of these programs throughout the country. It is assumed, however, that programs will cease at an early date. In the meantime, your committee and also the larger committee representing all the New England states are prepared to carry on.

By way of an addition to this report Dr. Ohler said that this work of postgraduate instruction will cease throughout the country in December and that it is the intention of his committee to carry on until that time.

He moved the acceptance of the report. This motion was seconded by Dr. Root, and it was so ordered by vote of the Council.

Committee on Maternal Welfare — Dr. Raymond S. Titus, Norfolk, chairman.

In the absence of the chairman, the Secretary read the following report:

On August 23 a meeting of the Committee on Maternal Welfare was held at the Boston Medical Library. The purpose of this meeting was organization. At this meeting a report on the EMIC program by a subcommittee of the Committee on Maternal Welfare was submitted.

This subcommittee wrote to the secretaries of the various districts of the Society asking for their reaction to the EMIC program. A reply was obtained from only two district secretaries. One report was favorable, and the other district society expressed its unqualified disapproval. Dr. McKay, who was present at the meeting, said that more than 50 per cent of the physicians in the state had participated in this program and that the results of the obstetric care, as reflected in maternal mortality, were excellent. The EMIC program will run for another year and a half, and reports of its progress will be made to this committee. The committee voted that the chairman should get in touch with Dr. Ohler relative to the refresher program. No elaborate program was deemed possible because of the continued lack of manpower due to the large number of men still in the service.

The Secretary moved the acceptance of the report. This motion was seconded by Dr. Chapin, and it was so ordered by vote of the Council.

Other Special Committees

Dr. Leavitt moved that a report of "no report" be accepted from the following special committees: Cancer, Council Rules, Expert Testimony, To Meet with Massachusetts Hospital Association, Physical Medicine and To Recommend Blue Shield Directors. This motion was seconded by Dr. Phippen, and it was so ordered by vote of the Council.

Appointment of Auditing Committee

The following Auditing Committee was nominated by the President: William B. Robbins, Suffolk, chair-

man, and Arthur W. Carr, Plymouth. There were no nominations from the floor. Dr. Richardson moved that the Secretary be instructed to cast one ballot bearing the names of the above-named nominees. This motion was seconded, and it was so ordered by vote of the Council.

The Secretary announced that he had complied with the directive and the President declared the nominations confirmed.

New Business

Communications

At the direction of the President the Secretary read the following letter:

August 28, 1945

Dr. Michael A. Tighe, Secretary
Massachusetts Medical Society
Boston, Massachusetts

Dear Doctor Tighe:

The Board of Trustees of the American Medical Association has appointed a committee to be known as the Committee on Rural Medical Service.

On invitation of the American Farm Bureau Federation, that committee has participated in a conference with representatives of the Farm Bureau Federation and has been invited to confer with a larger group composed of representatives of several national farm organizations that probably will meet during the month of September.

At the conference held in July with representatives of the American Farm Bureau Federation, the broad outline of the farm bureau plan to promote better rural health was fully discussed. It seemed to be apparent that the Farm Bureau Federation, like other influential farm groups, is opposed to compulsory federal legislation and is seeking means of accomplishing on a voluntary basis improvement and assistance of medical service for the farm population. It appeared to be the consensus that practical application of proposed plans should be on a state and county level.

The Committee on Rural Medical Service of the American Medical Association was informed that the American Farm Bureau Federation is sending a letter to its component state bureaus suggesting appointment of rural health committees to confer with similar committees representing constituent state medical associations. The Committee on Rural Medical Service agreed to communicate with the secretaries of all constituent associations and express the hope that each state association would appoint a committee on rural medical service that would be available for conferences with committees of the American Farm Bureau Federation and all other farm organizations since all planning for rural health improvement must have the benefit of the experience and advice of the organized medical profession. It is respectfully suggested that you bring this matter to the attention of the proper official body of your association at the earliest possible time.

Please advise me as to any action that may be taken with respect to the appointment of a committee on rural medical service so that results may be correlated by this committee.

Very sincerely yours,

(Signed) F. S. Crockett, M.D., *Chairman*
Committee on Rural Medical Service
American Medical Association

It was regularly moved and seconded that the Council authorize the President to appoint a committee for the purposes set forth in this letter. It was so ordered by vote of the Council.

At the direction of the President the Secretary read the following letter:

September 24, 1945

Dr. Reginald Fitz
319 Longwood Avenue
Boston, Massachusetts

Dear Dr. Fitz:

Mr. Cahalane has asked me to write to you stating that the Blue Cross will be very happy to work with the Massachusetts Medical Society to enable the members of the Society to form a Blue Cross group. We feel that it will be perfectly possible and very desirable to make arrangements whereby doctors who are not enrolled will have the opportunity to become Blue Cross members. Physicians who might wish to transfer from certain groups through which they now hold membership to the Massachusetts Medical Society group would be allowed to do so.

Of course, it should be understood that a satisfactory method of payment would have to be evolved, and perhaps the best way would be to have the Society bill all those who become Blue Cross members for their Blue Cross dues at the same time they are billed for their Society dues.

Perhaps the members of the Society would like to protect themselves and their families against surgical and obstetric bills through membership in the Blue Shield. If so, we could work out an arrangement similar to the one we suggest for the Blue Cross. We are aware of the courtesy privileges extended to the members of the profession, but we have had some instances where doctors have asked to be covered by Blue Shield if membership in the plan were possible.

Sincerely yours,

(Signed) E. J. Cunningham
Director of Enrollment
Massachusetts Hospital Service

Under the Council rules, the President referred this communication to the Committee on Public Relations.

At the direction of the President the Secretary read the following communication:

October 1, 1945

Reginald Fitz, M.D.
319 Longwood Avenue
Boston, Mass.

Dear Dr. Fitz:

We wish to employ at the Newton Hospital a doctor who has only a dental degree. For a number of years he was engaged in the practice of oral surgery in Boston, retiring before the war. Since Pearl Harbor he has put in a little over a year as a volunteer anesthetist, has carried out that work very efficiently and has met the approval of the surgeons with whom he has worked.

Our question is, Is it proper for a man possessing a dental degree to work as an anesthestist in the Newton Hospital under my supervision?

We would appreciate an early answer. Thanking you, I am

Sincerely yours,

(Signed) R. S. Hunt, M.D.
Anesthetist-in-Chief

Under the rules, the President referred the communication to the Committee on Ethics and Discipline.

At the direction of the President the Secretary read the following letter:

September 21, 1945

Dr. R. Fitz, President
Massachusetts Medical Society
8 The Fenway
Boston, Massachusetts

Dear Dr. Fitz:

The American Epilepsy League has for some years been instrumental in making it easier for people suffering with convulsive disorders to get in touch with a qualified physician for their treatment. With the great number of servicemen returning with a diagnosis of epilepsy, the Veterans Administration has turned to us for advice in suggesting men capable of handling epileptics in the rural districts of Massachusetts. At the present time, our referral list for Massachusetts is limited only to specialists.

I am sure that you can understand the importance of this request and our sincere desire to fulfill it. We are turning to you as president of the Massachusetts Medical Society for advice in the best manner for compiling such a list.

As you undoubtedly know, it is not necessary that a physician be a specialist in neurology to help epileptic sufferers. There are many instances where the up-to-date knowledge of treatment is not known. The League is in a position to put interested doctors in touch with these developments.

If a personal interview with you or telephone conversation will clarify my request in any way, I shall be delighted to see you. Because of the urgency of this matter, may I ask that you give it your attention at the first possible moment.

Sincerely yours,

(Signed) Esther C. Walther, *Executive Secretary*
American Epilepsy League, Incorporated

Under the rules, the President referred this letter to the Committee on Public Health.

Dr. Basil E. Barton, Norfolk, acting for the Norfolk District Medical Society, offered the following resolution:

> Resolved, That the president of the Massachusetts Medical Society be requested to refer to the appropriate committee a request to investigate the fee schedule of the Massachusetts Industrial Accident Board with a view to raising fees for such as indicated.

This resolution was referred by the President, under the rules, to the Committee on Public Relations.

Dr. Charles E. Mongan, Middlesex South, offered the following resolution:

> Whereas, The question has been repeatedly asked in public and private concerning the facilities of medical education in New England, and
>
> Whereas, No satisfactory scientific answer has been forthcoming; therefore be it
>
> Resolved, That the Massachusetts Medical Society undertake a survey of the medical educational facilities at present available in New England.

By way of explaining the purpose of this resolution, Dr. Mongan said that the question concerning the facilities for medical education in New England frequently arose in the sessions of certain of the committees of the Massachusetts Legislature and that no satisfactory answer had been forthcoming. It had been said, he continued, that New England could stand one more first-class medical school. He added that the only way in which the truth of this statement could be determined would be through a survey as provided for in the resolution.

Under the rules, the President referred this resolution to the Committee on Medical Education.

Dr. Harold R. Kurth, Essex North, offered the following resolution:

> That the Massachusetts Medical Society recommend to the State Board of Registration in Medicine that it initiate such procedures as lie within its jurisdiction to eliminate chiropractic practice in the Commonwealth of Massachusetts.

In support of this resolution Dr. Kurth said that all are aware that there is scarcely a town or city in Massachusetts in which there is not at least one or two practicing the chiropractic form of medicine. Dr. Kurth added that he was offering this resolution in the name of the Essex North District Medical Society. Under the rules, the President referred the resolution to the Committee on Legislation.

Dr. Phippen suggested to the Committee on Council Rules that provision be made whereby the report of the Executive Committee to the Council contain a résumé of the discussions which took place in the committee anent particularly important matters. He pointed out that, if this were done, much time and discussion might be saved in the meetings of the Council. The President referred this suggestion to the Committee on Council Rules.

Dr. Norman A. Welch reported for the Blue Shield as follows:

> This is simply a report of information for you on behalf of the Blue Shield. I am making part of the report for Doctor McCann in order that there will be no delay by having two people speak on the subject.
>
> The Blue Shield is progressing very satisfactorily, both financially and from the standpoint of increased subscriber membership. As of September 25, 1945, there were 183,190 participants consisting of 81,000 contracts. On December 31, 1943, there were 30,000 subscribers. This number jumped to 70,000 by December 31, 1944, and so far this year 113,000 members have been enrolled. From these figures, you can see that the enrollment in nine months of 1945 has exceeded the combined enrollment of both 1943 and 1944.
>
> The important thing which I want to bring to you on behalf of the president and directors of the Blue Shield is the prospective increase in benefits to subscribers. The original $25,000 which was given by the Massachusetts Medical Society to start this program has not been touched. At the time that the plan was started, the Commissioner of Insurance required that the Blue Shield put aside 25 per cent of the premiums received until there was a reserve of $225,000. The latest audited financial report available is that of July 31, 1945, at which time there was a reserve of $219,016. I have been assured by Mr. Cunningham that the reserve is now well above the $225,000 required by the insurance commissioner, so that it appears it will now be possible to use, for other purposes, the 25 per cent of the premiums, which we have not been able to touch.
>
> The expenses of operating the Blue Shield run in the neighborhood of 75 per cent of the premiums, and it is believed that the cost of adding medical care in the hospital will be below the remaining 25 per cent. Thus, it is felt that medical benefits may be added without increasing the cost of membership to the subscribers. We have a committee of physicians from various parts of the state that has taken up the question of adding medical benefits in the hospital to the Blue Shield program.
>
> I have visited the headquarters of the plan in New Jersey and have talked with the medical director. He believes that we can add the medical benefits and remain well within the 25 per cent available for this purpose. At the present time, a rough contract for the addition of such benefits has been submitted to the insurance commissioner for approval. Any change in the contract, such as that contemplated, must be approved by him in order that the subscriber may be adequately protected against failure of the plan or against loss of service that he is supposed to get. The projected arrangement provides for the payment to physicians for medical care in the hospital beginning with the first day of hospitalization and extending for a period of two weeks.
>
> In New Jersey the period of payment is three weeks, but under their plan they exclude payment for hospitalization of three days or less. The Blue Shield committee believes that the exclusion of the three days hospitalization is not advisable because of the necessity of this short period of time for diagnostic study in some cases. The feeling was that it would not be rendering satisfactory medical care to exclude a three-day diagnostic study period. In New Jersey they have found that 85 per cent of the patients with medical cases are hospitalized for three weeks or less. It is hoped, of course, that we may eventually extend the period of payment beyond two weeks, but it is considered wiser to maintain a sound financial setup when these benefits are first added.
>
> The fees planned for the physician are a payment of $5.00 for the first day and $3.00 for each subsequent day up to the limit of two weeks. The restriction to payment covering two weeks' hospitalization protects the plan financially against cases with chronic diseases of the heart and blood vessels. A substantial number of such cases could impose a severe financial burden on the plan and also serve to make it more difficult to discharge these patients from the hospital if their doctor's fee is being paid.
>
> In the matter of complications arising in the course of surgery and obstetrics, the medical payment is made for a period of two weeks from the time of expiration of the period of surgical or obstetric hospitalization. In other words, if the surgical contract covers hospitalization of sixteen or eighteen days, and a medical complication requires a hospital stay beyond that time, the payment to the medical man is taken care of for an additional time, up to the limit of fourteen days.
>
> There are some questions that have not yet been adequately answered in the proposed extension of benefits. One of these is the matter of the payment for contagious disease. In some sections of the Commonwealth these cases are hospitalized under the care of a salaried physician, but in other sections the private practitioner takes care of such cases on an isolation ward in a general hospital. In the latter instance it would seem that the physician should be paid for the care of contagious cases; whereas in the former instance, such a fee would represent double payment to the physician.
>
> At the present time, it is not thought wise to include payment for consultation service. It may be that this will eventually be included in the coverage given to the subscriber, but we must be extremely careful that we do not affect the financial solvency of this plan in its early days by the addition of further benefits.
>
> I believe that this covers the essential points involved in the extension of medical coverage to the subscriber under the Blue Shield program. It is hoped that, with the permission of the insurance commissioner, these benefits can be added to the contract within a comparatively short period of time, and that these will be added without any additional expense to the subscriber.

The President, under the rules, referred Dr. Welch's statement to the Committee on Postwar Planning.

The President announced that the Council had completed its business and that he would entertain a motion to adjourn. Dr. Phippen made such a motion. This motion was seconded by Dr. Leavitt, and it was so ordered by vote of the Council.

The President announced the Council adjourned at 1:50 p.m.

MICHAEL A. TIGHE, *Secretary*

APPENDIX NO. 1

ATTENDANCE OF COUNCILORS

BARNSTABLE

C. H. Keene
W. D. Kinney

BERKSHIRE

I. S. F. Dodd
C. F. Kernan
Solomon Schwager
Helen M. Scoville
P. J. Sullivan

BRISTOL NORTH

W. H. Allen
J. H. Brewster
R. M. Chambers
W. J. Morse
J. L. Murphy
W. M. Stobbs

BRISTOL SOUTH

G. W. Blood
R. B. Butler
J. E. Fell
Henry Wardle

ESSEX NORTH

E. S. Bagnall
R. V. Baketel
E. H. Ganley
H. R. Kurth
P. J. Look
G. L. Richardson
F. W. Snow
C. F. Warren

ESSEX SOUTH

H. A. Boyle
D. S. Clark
Loring Grimes
B. B. Mansfield
O. S. Pettingill
W. G. Phippen
E. D. Reynolds
H. D. Stebbins
P. E. Tivnan
C. F. Twomey
C. A. Worthen

FRANKLIN

H. M. Kemp
J. E. Moran

HAMPDEN

F. H. Allen
E. P. Bagg
W. A. R. Chapin
E. C. Dubois
Frederic Hagler
F. S. Hopkins
Charles Jurist
M. W. Pearson
A. G. Rice
A. H. Riordan
G. L. Schadt
J. A. Seaman

HAMPSHIRE

H. A. Tadgell

MIDDLESEX EAST

J. L. Anderson
Richard Dutton
E. M. Halligan
D. L. Joyce
R. W. Layton
M. J. Quinn
W. F. Regan
R. R. Stratton

MIDDLESEX NORTH

J. J. Cassidy
H. R. Coburn
W. M. Collins
D. J. Ellison
A. R. Gardner
W. F. Ryan
M. A. Tighe

MIDDLESEX SOUTH

E. W. Barron
J. M. Baty
J. D. Bennett
W. O. Blanchard
G. F. H. Bowers
Alice M. Broadhurst
Madelaine R. Brown
R. N. Brown
R. W. Buck
E. J. Butler
H. F. Day
C. L. Derick
J. G. Downing
C. W. Finnerty
H. Q. Gallupe
F. W. Gay
H. G. Giddings
J. L. Golden
Eliot Hubbard, Jr.
F. R. Jouett
E. E. Kattwinkel
A. A. Levi
A. N. Makechnie
Dudley Merrill
C. E. Mongan
G. M. Morrison
J. P. Nelligan
E. J. O'Brien, Jr.
Dwight O'Hara
S. H. Remick
Max Ritvo
E. H. Robbins
M. J. Schlesinger
E. W. Small
A. B. Toppan
J. E. Vance
B. S. Wood
Hovhannes Zovickian

NORFOLK

B. E. Barton
Carl Bearse
Arthur Berk
M. I. Berman
J. H. Cauley
G. L. Doherty
Albert Ehrenfried
H. M. Emmons
Susannah Friedman
B. A. Godvin
J. B. Hall
H. B. Harris
R. J. Heffernan
P. J. Jakmauh
I. R. Jankelson
C. J. Kickham
H. M. Landesman
D. S. Luce
F. P. McCarthy
H. L. McCarthy
R. T. Monroe
F. J. Moran
Hyman Morrison
D. J. Mullane
J. J. O'Connell
W. R. Ohler
G. W. Papen
S. A. Robins
D. D. Scannell
L. A. Sieracki
Kathleyne S. Snow
S. L. Skvirsky
J. W. Spellman
J. P. Treanor, Jr.
N. A. Welch

NORFOLK SOUTH

C. S. Adams
D. L. Belding
Harry Braverman
F. W. Crawford
Frederick Hinchcliffe
E. K. Jenkins
N. R. Pillsbury
D. B. Reardon

PLYMOUTH

P. H. Leavitt
C. D. McCann
G. A. Moore
B. H. Peirce
W. H. Pulsifer

SUFFOLK

A. W. Allen
W. H. Blanchard
W. J. Brickley
W. E. Browne
A. M. Butler
David Cheever
N. W. Faxon
Reginald Fitz
Somers Fraser
Maurice Fremont-Smith
Channing Frothingham
F. C. Hall
A. A. Hornor
H. A. Kelly
R. I. Lee
C. C. Lund
W. J. Mixter
Donald Munro
H. F. Newton
R. N. Nye
F. R. Ober
F. W. O'Brien
J. P. O'Hare
L. E. Parkins
L. E. Phaneuf
Helen S. Pittman
J. H. Pratt
W. H. Robey
H. F. Root
R. M. Smith
E. F. Timmins
J. J. Todd
S. N. Vose
Conrad Wesselhoeft
C. F. Wilinsky

WORCESTER

C. R. Abbott
B. H. Alton
A. W. Atwood
F. P. Bousquet
W. P. Bowers
E. J. Crane
J. M. Fallon
L. M. Felton
J. V. Gallagher
L. P. Leland
W. F. Lynch
J. C. McCann
A. E. O'Connell
H. L. Paine
O. H. Stansfield
T. L. Story
J. C. Sullivan
R. J. Ward
B. C. Wheeler

WORCESTER NORTH

H. C. Arey
D. B. Cheetham
C. B. Gay
G. P. Keaveny
J. V. McHugh

APPENDIX NO. 2

REPORT OF THE EXECUTIVE COMMITTEE OF THE COUNCIL

The Executive Committee of the Council has held three meetings since its last report of January 31, 1945.

A meeting held on May 23 was in lieu of the annual meeting of the Council. The wartime restrictions imposed by the Office of Defense Transportation made the Council meeting impossible. The transactions of this meeting are set forth in the July 26, 1945, issue of the *New England Journal of Medicine*.

The second meeting of the committee was held on August 22. This was of an emergency character. It was held for the purpose of giving consideration to two items of business that were of pressing importance.

The first had to do with a fee schedule submitted by the Committee on Rehabilitation. This fee schedule (Appendix No. 3), after modification by the committee, was approved by the Executive Committee, as an emergency measure, in the name of the Council. Dr. Richard Dutton, Middlesex East, at his request, was recorded as disapproving.

The second item of business had to do with a request that came from the Society's delegates to the Council of the State Medical Societies of New England that the sum of $100 be contributed toward defraying the expenses of this council. The committee, subject to review by the Committee on Finance, approved this appropriation in the name of the Council of the Massachusetts Medical Society.

The third meeting — the pre-Council meeting of the Executive Committee — was held on September 26, 1945.

The committee reviewed the reports that are to be considered by the Council. It recommends the acceptance of those that are purely informational. It recommends that those that contain recommendations be accepted and that the recommendations contained in them be adopted with one exception, namely, that in the case of the report of the Committee Appointed to Study a Possible Revision of the By-laws as They Relate to the Election of Fellows, it recommends that the words "if possible" appearing in the second recommendation be deleted and that the word "may" be inserted in the same recommendation between the word "committee" and the word "be."

The committee noted that certain recommendations, which appeared in the report of the Subcommittee on Public Information of the Committee on Postwar Planning, were withdrawn and that likewise withdrawn were the first and second recommendations, which appear in the supplementary report of the Committee on Postwar Planning.

The committee reviewed a joint report and resolution to be submitted to the Council by the Committee on Public Relations, the Committee on Legislation and the Committee on Postwar Planning.

The Executive Committee recognized that these withdrawals and the joint report and resolution represented an attempt to meet in the person of one individual the needs of the Society as expressed by these three committees. The Executive Committee unanimously recommends that the Council accept this latter report and adopt the resolution contained in it.

The committee has approved of the President's act in appointing two fellows of the Society to attend, at the Society's expense, a conference on public relations to be held in Chicago under the auspices of the Council on Medical Service and Public Relations of the American Medical Association.

The committee recommends that the War Participation Committee be discharged by the Council, with an expression of gratitude to its chairman and members for their valuable contributions to the war effort.

The Committee reviewed and approved the following ad interim appointments made by the President:

To the Committee on Industrial Health:
Dr. Thomas L. Shipman, Essex South, *chairman* (a member of this committee from 1942)

To the Committee on Postwar Planning:
Dr. Elmer S. Bagnall, Essex North

To the Subcommittee on Hospitals of the Committee on Postwar Planning:
Dr. Harold Jeghers, Norfolk

To the Medical Advisory Committee to Regional OPA:
Dr. F. Gorham Brigham, Norfolk

Representatives from the Society to the New England Medical Council:
Dr. Dwight O'Hara, Middlesex South
Dr. Allen G. Rice, Hampden
Dr. Michael A. Tighe, Middlesex North

Representatives from the Society to the Massachusetts Central Health Council:
Dr. James W. Bunce, Berkshire
Dr. Merrill E. Champion, Suffolk
Dr. George D. Henderson, Hampden
Dr. William D. Kinney, Barnstable
Dr. Robert B. Osgood, Suffolk
Dr. Roy J. Ward, Worcester

Representative from the Society to the Organization Known as "Mental Health for Victory":
Dr. Abraham Myerson, Norfolk

Representative from the Society to the Hospital Council of Boston for the Year 1945:
Dr. William E. Browne, Suffolk

Representative from the Society to the Legislative Committee of the Massachusetts Central Health Council:
Dr. William E. Browne, Suffolk

Representative from the Society to the Massachusetts Committee for Nurses Procurement and Assignment Service:
Dr. Dwight O'Hara, Middlesex South

Representative from the Society to the Massachusetts Nursing Council for War Service:
Dr. David D. Scannell, Norfolk

Representative from the Society to a Professional Advisory Committee Organized by the Division of Vocational Rehabilitation of the State Department of Education for the Purpose of Establishing a Program of Physical Restoration:
Dr. Joseph H. Shortell, Suffolk

The printed circular of advance information contains a letter from the Committee on Rural Medical Service of the American Medical Association. In accordance with the request contained in the letter the Executive Committee recommends that the Council direct the President to appoint a committee of three to confer with a committee of the Massachusetts Farm Bureau Federation concerning rural medical service.

MICHAEL A. TIGHE, *Secretary*

APPENDIX NO. 3

FEE SCHEDULE SUBMITTED BY THE COMMITTEE ON REHABILITATION

This schedule was approved by the Executive Committee of the Council in the name of the Massachusetts Medical Society.

This approval was given in a special session of the Executive Committee held on August 22, 1945. The necessity for this action was based on the committee's judgment that an emergency was involved.

This schedule was offered to the Division of Vocational Rehabilitation of the Massachusetts Department of Education at the request of the division itself. This division will pay the medical-care costs of those individuals who have static and remediable physical difficulties and who, through their own efforts, cannot meet such costs. The individual receiving aid in this program need not show indigence.

I. EXAMINATIONS

A. General medical examination (see *Manual of Policies*, Chapter VIII) to include medical history and physical examination.	$5.00
B. Examination by specialist	10.00
C. X-ray examination:	
Extremities	5.00
Hip, femur, shoulder	10.00
Skull	10.00
Spine (one section, as lumbar spine)	10.00
Spine (two or more sections, as lumbar and sacral)	15.00
Spine (entire, with cervical)	20.00
Barium meal — gastrointestinal tract	20.00
Barium enema	15.00
Urological — simple K.U.B.	5.00
Urological — pyelography intravenous (with injection of medium)	20.00
Urological — pyelography retrograde	25.00
Chest	10.00
Gall bladder	15.00
D. Laboratory Examination:	
Bacteriological:	
Cultural examination for fungi	5.00
Routine culture	2.00
Pus or exudate, cultural examination, including classification of organism	5.00
Throat culture including classification of organism	5.00
Blood culture	5.00
Examination of smears	2.00
Pathological:	
Tissue examination	5.00
Frozen section, rush diagnosis at laboratory	10.00
Guinea-pig inoculation	5.00

Blood:	
Hemoglobin (Sahli)	2.00
Red count, white count, differential and hemoglobin	5.00
Red count	2.00
White count	2.00
Differential	2.00
Platelet count	2.00
Malarial parasites	2.00
Bleeding and coagulation time	2.00
Fragility test	5.00
Sedimentation time	5.00
Clot retraction	2.00
Prothrombin time	3.00
Hematocrit	3.00
Grouping for transfusion	3.00
Direct agglutination	5.00
Kahn	3.00
Hinton (routine)	3.00
Hinton (rapid)	3.00
Kolmer-Wassermann	5.00
Schwartz-McNeil (complement-fixation test for gonorrhea)	5.00
Heterophil antibody reaction	3.00
Blood Chemistry:	
Albumin-globulin ratio	5.00
Bromides	3.00
Calcium	5.00
Cephalin — cholesterol	3.00
Chloride	3.00
Cholesterol	5.00
Carbon dioxide combining power	5.00
Creatine	3.00
Diastase	3.00
Galactose-tolerance test	5.00
Icterus index	2.00
Nonprotein nitrogen	3.00
Phosphatase, acid	5.00
Phosphatase, alkaline	5.00
Phosphorus	5.00
Potassium thiocyanate	3.00
Sugar	3.00
Sugar and nonprotein nitrogen (same blood)	5.00
"Sulfa" concentrations	3.00
Total protein	3.00
Urea nitrogen	3.00
Uric acid	3.00
Van den Bergh	3.00
Feces:	
Gross and microscopic, complete	5.00
Occult blood	2.00
Fat	1.00
Parasites	2.00
Ameba	5.00
Skin tests:	
Protein sensitization test (series), including allergens for purpose of establishing causative factor	10.00
Protein tests (each group of 25 proteins)	5.00
Hay-fever test	5.00
Tuberculin	2.00
Spinal fluid:	
Routine (cell count, globulin, culture and sugar)	5.00
Cell count	2.00
Culture	2.00
Quantitative:	
Protein	3.00
Sugar	3.00
Chloride	3.00
Gold sol	3.00
Davies-Hinton	3.00
Kolmer-Wassermann	5.00
Stomach contents:	
Gastric analysis	5.00
Urine:	
Routine	2.00
Routine without microscope	1.00
Microscope alone	1.00
Hippuric acid	3.00
Diastase	3.00
Urobilinogen	2.00
Kidney function test (phenolsulfonephthalein)	3.00
Bence-Jones protein	3.00
Electrocardiogram	10.00
Miscellaneous:	
Basal-metabolism test	10.00
Autogenous vaccine	5.00

II. TREATMENT

A. Anesthesia:	
General anesthetic (including intravenous)	10.00
Prolonged cases (over 45 minutes)	15.00–25.00
Spinal anesthesia	20.00
Rectal anesthesia	10.00
B. Operations — Thoracic:	
Bronchoscopy	30.00
Bronchoscopy and biopsy	40.00
Paracentesis of thorax	15.00
Phrenic-nerve operation	50.00
Thoracoplasty (each stage)	100.00
Lobectomy	100.00
Thoracostomy	50.00
Artificial pneumothorax:	
First induction	25.00
Refills	10.00
Operations — Abdominal:	
Paracentesis	15.00
Herniotomy — ventral, inguinal, or femoral	75.00
Herniotomy — ventral or inguinal (bilateral)	100.00
Herniotomy — postoperative	100.00
Facial repair (extra allowance)	10.00
Herniotomy — diaphragmatic	100.00
Esophagus, dilatation of	25.00
Esophageal diverticulum (one-stage)	100.00
Esophageal diverticulum (two-stage)	125.00
Gastroscopy	25.00
Gastric ulcer, excision of	125.00
Gastrectomy	150.00
Gastroenterostomy	150.00
Intestinal anastomosis	150.00
Intestinal resection (small)	125.00
Adhesions, freeing of	75.00
Laparotomy, exploratory	75.00
Colon, resection of	150.00
Appendectomy	75.00
Cholecystectomy	125.00
Cholecystectomy, with common-duct surgery	150.00
Splenectomy	150.00
Operations — Proctologic:	
Hemorrhoidectomy — external (single)	25.00
Hemorrhoidectomy — external (multiple) and internal	50.00
Polyps, removal of	25.00
Fistula in ano	50.00
Carcinoma of rectum, excision of	150.00
Prolapse of rectum, repair of	100.00
Anal fissure	40.00
Prolapse of rectum — abdominal fixation	100.00
Proctoscopy	10.00
Sigmoidoscopy	10.00
Operations — Urologic:	
Cystoscopy	15.00
Cystoscopy (urethral catheterization)	20.00
Cystoscopy, operative (stone, biopsy, fulguration)	25.00
Circumcision	25.00
Urethrotomy — external	75.00
Urethrotomy — internal	50.00
Urethral stricture, dilatation of	5.00
Prostatectomy — perineal	125.00
Prostatectomy — transurethral	100.00
Prostatectomy — suprapubic	150.00
Perineoplasty	75.00
Hydrocele (radical operation)	50.00
Litholapaxy	75.00
Epididymectomy	50.00
Varicocele, operation for	50.00
Orchidectomy, simple	50.00
Orchidectomy, with gland dissection	100.00
Cystotomy or cystostomy	75.00
Cystotomy or cystostomy, with radium or fulguration	100.00
Ureter, transplantation of (single)	75.00
Ureter, transplantation of (bilateral)	150.00
Bladder tumor, fulguration of	25.00
Bladder tumor, resection of	125.00
Ureteral stone, removal of	125.00
Nephrectomy or nephrotomy	150.00
Nephropexy	150.00
Pyelectomy, with removal of calculus	150.00
Pyloroplasty	150.00
Amputation of penis for carcinoma, with resection of glands	125.00
Operations — Gynecologic:	
Bartholin's gland, excision of	25.00
Urethral caruncle, removal of	15.00
Labial cysts	25.00
Fistula — rectovaginal	100.00
Fistula — vesicovaginal	100.00
Dilatation and curettage	25.00
Uterine polyp, removal of	25.00
Cervix, amputation of	50.00
Oophorectomy	100.00
Hysterectomy — vaginal	100.00
Hysterectomy — supravaginal abdominal (simple)	100.00
Hysterectomy — supravaginal abdominal (complicated)	125.00
Hysterectomy, supravaginal abdominal, with gynecologic repair work (simple)	125.00
Hysterectomy, supravaginal abdominal, with gynecologic repair work (complicated)	150.00
Panhysterectomy	150.00
Myomectomy	75.00
Uterine displacement, abdominal operation	100.00
Uterine displacement, abdominal operation, with gynecologic repair work	125.00
Salpingectomy	100.00
Combined cervical and vaginal repair	75.00
Prolapse of uterus, repair of	100.00
Operations — Otologic:	
Mastoidectomy — radical (single)	100.00
Mastoidectomy — radical (bilateral)	150.00
Fenestration	150.00
Operations — Nose and Throat	
Nasal polyp, removal of	10.00
Antrum (Caldwell-Luc operation)	100.00
Ethmoidectomy	50.00
Frontal sinus — radical	100.00
Submucous resection	50.00
Palatorrhaphy	100.00
Tonsillectomy and adenectomy	25.00
Larynx, benign tumor, removal of	50.00
Tracheotomy	50.00
Laryngoscopy — diagnostic	10.00
Laryngoscopy — operative	25.00
Operations — Neurosurgical:	
Myelogram (preceding surgery) plus x-ray fee	40.00
Decompressive laminectomy	150.00
Rupture of intervertebral disk, removal of or exploration for	150.00
Rupture of intervertebral disk, with fusion operation (two teams)	250.00
Spinal-cord tumors	150.00

Scaleniotomy	50.00
Nerve suture	100.00
Sympathectomy — cervical	175.00
Sympathectomy — thoracolumbar (unilateral)	150.00
Resection presacral plexus, resection of	100.00
Cistern puncture	50.00
Skull, decompression of	100.00
Tumor of brain	200.00
Gasserian ganglion, section of posterior root	150.00
Neuroma, excision of arm or leg	75.00
Neuroma, excision of finger or toe (single)	25.00
Neuroma, excision of finger or toe (multiple)	50.00
Operations — Orthopedic:	
Amputations:	
Shoulder	100.00
Upper arm	75.00
Forearm	75.00
Hand	50.00
Finger (one)	25.00
Each additional one	10.00
Hip	125.00
Thigh	100.00
Knee	100.00
Lower leg	75.00
Toe (one)	25.00
Each additional one	10.00
Arthroplasty:	
Any major joint	150.00
Arthrodesis:	
Any major joint	150.00
Joint resection:	
Shoulder	150.00
Elbow	100.00
Wrist	100.00
Hip	150.00
Knee	100.00
Ankle	100.00
Joint dislocation — recurring (any major joint)	150.00
Other operations:	
Spine fusion	150.00
Bone graft (for non-union)	150.00
Bone drilling (for non-union)	75.00
Foot stabilization	150.00
Tendon repair (old case)	75.00
Supraspinatus tendon, repair of	150.00
Arthrotomy (any major joint)	100.00
Removal of bone plate	35.00
Hallux valgus (unilateral)	75.00
Hallux valgus (bilateral)	100.00
Hammer toe (one)	25.00
Sequestrum, removal of (superficial)	25.00
Sequestrum, removal of (deep)	125.00
Torticollis, operation for	100.00
Plaster Casts (not including first application with operation):	
Forearm	7.50
Whole arm	10.00
Shoulder spica	20.00
Leg to knee	7.50
Leg to groin	10.00
Hip spica	25.00
Plaster jacket	25.00
Plaster jacket (including head)	30.00
Operations — Miscellaneous:	
Blood transfusion (not including cost of blood)	10.00
Adenectomy — cervical or inguinal (simple)	20.00
Adenectomy — cervical or inguinal (radical)	75.00
Adenectomy — radical (complete neck or groin)	150.00
Biopsy — lymph node, bone, skin or muscle	25.00
Biopsy — superficial structures	10.00
Biopsy — deep structures (node, bone, breast or muscle)	20.00
Breast, resection of (simple)	75.00
Breast, resection of (radical)	150.00
Carcinoma of lower lip, excision of (simple)	50.00
Carcinoma of lower lip, with neck dissection	150.00
Carcinoma of tongue, excision of	100.00
Dupuytren's contracture (radical)	100.00
Femoral artery, ligation of (unilateral)	50.00
Femoral vein, ligation of (bilateral)	75.00
Ingrown toenail, excision of	20.00
Lumbar puncture	10.00
Pilonidal sinus, excision of	50.00
Tenotomy	25.00
Thyroid artery, ligation of	75.00
Vena cava, ligation of	150.00
Thyroidectomy — subtotal (bilateral)	125.00
Thyroidectomy — two-stage subtotal	150.00
Varicose veins — ligation of saphenous vein, high:	
Unilateral	50.00
Bilateral	75.00
Varicose veins, with ligation of perforating veins	100.00
Varicose veins, injection treatment of (each)	5.00
Varicose ulcer — excision and graft	100.00
Plastic operations — minor	75.00
Plastic operations — extensive	150.00

In the above cases when the fee is $100 or less, two weeks' aftercare is included. In cases in which the fee is over $100, three weeks' aftercare is included.

Extra visits when necessary beyond the stated periods shall be at the rate of $3 for a house or hospital visit and $2 for an office visit.

When an assistant is deemed necessary he shall be allowed a fee of $10 in all cases wherever the operative charge is $100 or less and 10 per cent of the operative fee in all cases wherever the operative fee is more than $100 except in those cases wherein the assistant is a full-time employee of the hospital in which the operation is performed.

III. Medical Care

Medical care shall be placed at the disposal of such cases as are static and which, with adequate care, offer good prognoses.

The fees for medical services in such cases needing hospital care and requiring the services of a physician devoting his time to a particular specialty, shall be at the rate of $5 per day for the first week and $25 per week for all subsequent weeks, provided the total charge does not exceed $150.

The fees for medical services in such cases treated by a general practitioner shall be at the rate of $5 for the first visit, whether in the home, hospital or office, $3 for each subsequent visit in the hospital or home, and $2 for each subsequent visit to the physician's office, provided the total amount charged shall not be in excess of $150.

APPENDIX No. 4

Report of the Committee on Legislation

The first meeting of this committee for the legislative year 1945 was held on December 26 and the last on August 15, on which date, following the resignation of W. E. Browne, of Suffolk, Humphrey L. McCarthy, of Norfolk, was elected chairman for the year 1946. Between those two dates we considered and acted on nineteen bills in the Senate and fifty-one bills filed in the House. We reported to the Council on January 31 and to the Executive Committee, acting for the Council, on May 23, and from each of these bodies received approval without reservation for work done. A great majority of the members of the Society who read the pages of the *New England Journal of Medicine* are somewhat familiar with these bills affecting public health and action taken on these bills.

In the August 23 issue of the *Journal*, a comprehensive résumé may be found of the work done. Some members of the committee, and the chairman, had had no experience at the State House before January 1 of this year. We have had considerable experience since that time. The two reports of the committee referred to above, which have been printed in the *Journal*, make repetition of our activities unnecessary. We unfortunately made mistakes and we have some recommendations. With information available to us at the first of the year, and with insufficient time to get more, we were unable to discuss clearly at times some matters with the Public Health Committee, the Committee on Education, and the Ways and Means Committees of the House and the Senate, and to give to these committees information which they asked. We did not know, for example, the status of chiropractors licensed in some degree and permitted to practice in forty-three states in the country; nor did we have a comprehensive knowledge of licensure affecting osteopaths. The chairman has sent a questionnaire to each licensing board and state medical society and from each, without exception, has received nearly complete answers as to their methods and degrees of grades of licensure of chiropractors, osteopaths and regular practitioners of medicine, and information received will certainly be helpful in the future.

It was noted that in matters of legislation affecting particularly certain groups, those representing such groups who were well prepared to discuss their measures at times fared better than the rest of us; for example, the Massachusetts Medico-Legal Society, under the direction of Dr. Peirce H. Leavitt, which had enacted desirable laws affecting medical examiners; and those under the direction of Dr. Sidney Farber, who finally, by a close shave, had maintained present laws in regard to vivisection, changes in which, as proposed, would ultimately have harmfully affected the health of our people in a serious manner.

It probably is correct to say that in the matter of osteopathy, the single measure obtained and which is now law may be considered by some to have lowered in some degree standards by which persons may practice medicine in this state. Perhaps in the near future the Legislature will be asked its judgment in grading the practice of osteopaths, which in many ways seems necessary. In some states, as you may know, osteopaths according to the training they may have are graded as to things they may do. Under the direction of former Lieutenant-Governor Cahill, who was paid for his

work (and we have no grievance with that) by the osteopaths, the Approving Authority was increased in membership to five, retaining the present members, consisting of the Commissioner of Education, the Commissioner of Public Health and the secretary of the Board of Registration in Medicine.

We would feel we had not done our duty did we fail to mention the amount of time devoted intelligently at the State House by Dr. H. Quimby Gallupe, representing the Board of Registration in Medicine. Dr. Vlado Getting, the Commissioner of Public Health, was always well prepared to discharge his duties before various committees and did so in an efficient manner. It should here be stated that the officers of the Society and former officers, lay persons, certain members of the House and Senate really worked hard in order that the House and Senate might have before these bodies information which should have been helpful in casting their votes. The work done by several of the district societies was outstanding. In all probability all the district societies did some work, although it was difficult to measure the effectiveness of the work which may have been done by two or three of the district societies. One of our mistakes may have been that we failed to use proper means to make articulate a great many of the members of the Massachusetts Medical Society. Probably many of these would have helped a great deal had we succeeded in reaching them. All members of the Society, however, through their district legislative committees, should have been acquainted with activities at the State House affecting in one way or another public health. A great many members did excellent work in personally interviewing members of the House and Senate. The family doctor was a vital force in proper personal interviews with members of the House in the matter of bills which would, had they passed, have aided substandard schools of medicine. On these bills alone we spent nine full days at the State House, not to speak of parts of days which were devoted to these bills. The vote, as you know, in the House was 148 to 74.

The day has gone by in which it was felt only a few needed to work; the present is here, and the work of those who have been active is insufficient; and the future is ahead. It will require concerted, articulate, letter writing membership to assert itself properly.

Some expenditure of money will be necessary and the amount should be determined by the Council. Really considerable sums as we consider money may have been spent by some groups. We are informed the osteopaths were asked to contribute considerable in order that their expenses might be paid, including the amount well earned by former Lieutenant-Governor Cahill. We paid no one in connection with osteopathy or chiropractic or any other bill more than a nominal sum which by no means paid for in full the work which was done by our legislative counsel, Mr. Charles Dunn. We should not be called on to raise and spend money of our own when we are not asking for or seeking anything for ourselves personally, and when our sole aim so far as we are concerned is not only to preserve the present standards of the practice of medicine in this state but to raise those standards.

The Governor of the Commonwealth, after real study and after giving the matter the time it deserved, vetoed the Chiropractic Bill, and this veto says so much in regard to licensure generally we herewith insert it in our report.

The Commonwealth of Massachusetts
Executive Department, State House
Boston, July 20, 1945

To the Honorable Senate and House of Representatives:

I am returning herewith without my approval House 1738 entitled, "An Act Establishing the Board of Registration of Chiropractors and Defining Its Powers and Duties."

The enactment proposes the establishment of an entirely new Board for the examination and registration of applicants seeking to practice a method of healing the sick. It would set up a new and different administrative method of regulating a branch of the practice of medicine as that term generally relates to the prevention, cure and alleviation of disease, the repair of injury, or treatment of abnormal or unusual states of the human body and their restoration to a healthful condition. It would establish new and different standards of education and qualification for applicants seeking to practice in a field in which minimum standards are already established by statute. Thus, it would introduce into the statutory system a "double standard" for the selection of practitioners in the field of medicine.

The object of regulatory legislation in the field of medical science heretofore adopted by the General Court is the promotion of the public good and the protection of our citizens against the evils normally resulting from the attempts of uninformed and unskilled persons to practice the healing arts. The Legislature wisely has not granted exclusive rights of practice to any particular method of healing. In Section 7 of Chapter 112 of the General Laws it is expressly declared that the statutory provisions relating to the examination and registration of applicants seeking to practice medicine" . . . shall not be held to discriminate against any particular school or system of medicine . . . ." But just as wisely, the General Court heretofore has recognized that, as the knowledge of the science of medicine increases and methods of treatment of the ill improve, the public good requires the new practitioner to be better informed and better equipped; and, accordingly, it has required that minimum standards of education and qualification be met by all applicants irrespective of the particular system or method of treatment they espouse. The beneficial effect upon our citizens generally of such a policy is clearly apparent. On a subject of so much importance to every one of the citizens of the Commonwealth, the legislative policy which has been so long pursued should not be halted or turned aside unless the public good clearly requires another course.

Such a policy has not prevented the development or practice of particular methods or systems of medicine nor has it denied to the public access to treatments prescribed by such systems. The osteopathic method, for example, has been and is now practiced in the Commonwealth under the provisions of the statutes relating to the practice of medicine. Similarly, within the scope of the same legislative policy the chiropractic method should be practiced.

Respectfully,

(Signed) Maurice J. Tobin
Governor of the Commonwealth

Following passage of this bill, we held meetings and as a result of these Doctors Mongan, Spellman, Heffernan, Good, Doyle, Tighe, Wilinsky and Browne visited the Governor. It was his thought that the doctors of the Massachusetts Medical Society and others had not sufficiently set forth their views to the members of the House and the Senate. His Excellency did not tell us what he would do except to give the matter further study. He sent an attorney-at-law to meet with us and we honestly gave him our thoughts on this measure. We explained to the Governor that we felt we had in a proper way made our position on this matter as clear to the members of the Legislature as we had in the matter of bills affecting substandard schools. We know we were in communication with 179 of the 240 members of the House, and 38 of the 40 members of the Senate. We do not know what the chiropractors did that we did not do.

On the whole, the results of the year's work have been satisfactory. At the meeting held August 15 the committee voted that we recommend to the Council that a column in the *Journal* be devoted to these matters of legislation so that all the members of the Society may be abreast of the times. It was suggested that the chairman of the Committee on Legislation might edit this column. However, the Council may decide that. The Secretary of the Society has informed us that space in the *Journal* is ready for this now and has heretofore been available. The committee recommends a combined meeting of at least the executive groups with the Subcommittee on Public Information of the Committee on Public Relations and the Committee on Legislation in order that insofar as the practice of medicine is concerned the people of our state may know our thoughts and have our viewpoints. The Wagner–Murray–Dingell Bill lies ahead. The present chairman of the Committee on Legislation will later briefly discuss this Bill.

The retiring chairman is extremely grateful to his coworkers on the Committee on Legislation and to all others, and in a particular way the family doctor, for the help given.

W. E. Browne, *Chairman*

APPENDIX NO. 5

Report of the Committee on Postwar Planning

Meetings of the Committee on Postwar Planning, its Executive Committee and its subcommittees, have been held since the last meeting of the Executive Committee of the Council, and various subjects have been considered.

The need for a physician as secretary and educational director of the Society has been discussed. The duties of such a position might include, first, the development of services for returning medical veterans in relation not merely to their postgraduate training but to aiding them in other ways, such as providing information in regard to location for practice, and secondly be concerned not alone with postgraduate education within the membership of the Society but particularly with the Society's program for extending medical information to the public.

Representatives of the trustees, superintendents and chiefs-of-staff of ninety-eight hospitals in Massachusetts

having more than one-hundred-bed capacity were invited to a special meeting on June 20. One hundred and forty-eight guests were present and heard a discussion of the need for providing additional internships and residencies in Massachusetts hospitals and extending postgraduate instruction.

On the basis of the interest expressed at this meeting, the Subcommittee on Hospitals plans to send to hospitals not already approved by the Council on Medical Education and Hospitals of the American Medical Association reprints of essentials of approved internships and of approved residencies and fellowships and also a prepared letter from the committee dealing with internships and fellowships. This letter will include an offer to such hospitals as may be contemplating application for approval of advice and consultation. Also, the committee will seek to aid hospitals already approved in securing interns and residents.

After September 1 and following the circularization of the above-mentioned material, the committee hopes to bring about a meeting in Boston of the administrators, and possibly the physicians and surgeons-in-chief, of those hospitals who have affirmed their willingness to seek approval for internships and residencies.

The committee further proposes to make a determined effort to interest the representatives of a selected group of the largest hospitals of the Commonwealth not approved at the present time for internships and residencies to seek such approval.

The Subcommittee on Postgraduate Instruction has decided to start courses in the fall. The instruction will be open without charge to all physicians of Massachusetts who are legally registered. The educational program will be administered on the basis of seven circuits whose boundaries may overlap the Society districts. A teaching center in each area will be established from which instructors will go to nearby places. Teaching will be by a team of instructors who will make the rounds of the circuit on the schedule covering one or more days.

Courses in Boston will be conducted in local hospitals and an attempt is being made to work with local hospitals and clinics to increase the opportunities for postgraduate instruction and especially to provide increased opportunities, through the Clinical Information Bureau, for informing the returning veteran doctors of the opportunities in this state.

The Subcommittee on Medical Economics has studied the Blue Shield. It has postponed any comment on post-payment plans, such as the Blue Triangle endorsed by the Council, pending additional information. It unanimously approved the following principles with regard to the prepayment of medical expense endorsed by the Council and in operation by the Blue Shield: the service principle for the lower income group and the extension of the present coverage to include the medical care of patients in hospitals as soon as the requirements of the Massachusetts Department of Insurance can be met. It urges all licensed physicians who are able to render the service offered to support the Blue Shield. The details of the work of this subcommittee, together with a statement by Dr. James McCann, president of the Blue Shield, has been published in the *Journal*.

The Subcommittee on Organization has considered various means for improving the usefulness of the Massachusetts Medical Society to its constituent members. It has submitted for study to the Committee on Council Rules the following resolution:

> Upon receipt of the agenda of each regular meeting of the Executive Committee, the president of each district society shall call a meeting of the councilors and the executive committee member. The councilors shall consider each item of the agenda and instruct the committee member as to their desires.

HOWARD F. ROOT, *Chairman*
LEROY E. PARKINS, *Secretary*

APPENDIX NO. 6

REPORT OF THE COMMITTEE APPOINTED TO STUDY A POSSIBLE REVISION OF THE BY-LAWS AS THEY RELATE TO THE ELECTION OF FELLOWS

At a meeting of the Executive Committee of the Council of the Massachusetts Medical Society held May 3, 1945, a committee was appointed by the President to study revision of the election of fellows and report on this matter to the Council through the Executive Committee.

The basis for the appointment of this committee was that in certain instances applicants who had been approved by a district committee on membership had been disapproved or approval had been withheld by the State Committee on Membership.

The whole matter was thoroughly reviewed and at the last meeting of the committee, held on June 27, 1945, Dr. Harlan F. Newton, Chairman of the State Committee on Membership, was present. In our consideration of the matters involved, the committee carefully discussed the procedure and investigation which the district committee instituted before approval of an applicant, and also the procedure and investigation that the State Committee instituted before its final decision on rejection or approval of an applicant.

During the course of our deliberations it appeared to your committee that any differences of opinion in regard to approval of a candidate by the State Committee was mainly because, when a candidate had failed to pass the State Committee after having obtained approval by the district committee, the latter had no information as to why the candidate did not receive the approval of the State Committee, and consequently it was felt that the district committee's recommendations were not given sufficient consideration. This, naturally, was a source of misunderstanding.

In our study it was brought out that despite the inclusion in the by-laws that letters recommending applicants should not be of the so-called rubber stamp type but contain definite information about the candidate in regard not only to his good points but also, if such existed, information of a critical nature. It was found that the majority of these letters were very brief and lacked definite information. It was also the policy of the State Committee to welcome the presence of either the secretary or any other officer of the district committee at its deliberations, but as a whole, these officers rarely attended a meeting of the State Committee. It was found that the district committees on membership comprised men of high integrity and gave earnest consideration to the qualifications of the applicants before submitting their approved list to the State Committee. It was also noted that the State Committee had many sources of information by reason of their exhaustive study of each applicant, which were not available to the district committees and when an applicant failed approval by the State Committee, it was after thorough study and evaluation of the individual in the light of information gleaned from various sources, many of which were without the scope of the district membership committees.

The committee was definitely of the opinion that the main source of friction between the central and district committees on membership would be eliminated if, before final disapproval of an applicant by the State Committee, an officer of the district society be invited to review the evidence in the files of the State Committee and, therefore, be cognizant of the evidence on an individual candidate and be familiar with the reason for the action of the State Committee. This suggestion was definitely approved by Dr. Newton and, as said previously in this report, he and his committee would gladly welcome the presence of either the secretary or any other officer of the district at their meetings.

It was the opinion of your committee that the State Committee is composed of men of the highest type who realize the responsibility imposed upon them in the selection of applicants for membership in the Massachusetts Medical Society. They give a tremendous amount of time and labor to the investigation and evaluation of each applicant; their final decision is made after extremely careful consideration and is entirely impersonal. It was also felt by your committee that this whole matter could be adjusted satisfactorily to all, and within the present by-laws, by inviting an officer of the district society to confer with the State Committee before disapproval of any applicant recommended by a district committee on membership.

The committee appointed to study revision of election of fellows recommends:

(1) That letters recommending candidates from non-approved or foreign medical schools be definitely detailed, specific and informative in regard to the applicant.
(2) That, if possible, an officer of the district society or member of the district membership committee be present at the deliberations of the State Committee on Membership when applicants from their district are under consideration.

(3) That the State Committee on Membership, acting within the by-laws, invite an officer of the district society or a member of the district committee on membership to review with them the record of an applicant before final decision of disapproval of such an applicant is made.

It is the opinion of your committee that the above recommendations will result in elimination of any misunderstanding that has occurred in the past between the State Committee on Membership and the district committees on membership.

CHARLES J. KICKHAM, *Chairman*
WILLIAM A. R. CHAPIN
C. BERTRAM GAY
PEIRCE H. LEAVITT
DONALD MUNRO
DANIEL B. REARDON
MICHAEL A. TIGHE

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

Weekly Clinicopathological Exercises

FOUNDED BY RICHARD C. CABOT

TRACY B. MALLORY, M.D., *Editor**

BENJAMIN CASTLEMAN, M.D., *Acting Editor*

EDITH E. PARRIS, *Assistant Editor*

CASE 31511

PRESENTATION OF CASE

A forty-six-year-old crane operator was admitted to the Emergency Ward in a semi-stuporous condition. The history was obtained from his wife.

Four days before admission, while eating breakfast, the patient was suddenly seized by a severe shaking chill and his temperature rose to 102°F. A physician prescribed a sulfonamide, milk of magnesia and paregoric. He had several more shaking chills that day. At the same time, vomiting and severe diarrhea developed. Until the time of admission he continued periodically to vomit yellow, thin fluid and had eight to ten copious bowel movements a day. The stools were watery and cloudy. He developed an intense craving for water. During the period of his illness he had passed no urine. He had not complained of pain. About twelve hours before admission, he had a large watery stool and soon after collapsed, remaining unconscious for a short time. The systolic blood pressure at that time was said to have been about 40.

Physical examination revealed a well developed man about six feet tall and weighing about 250 pounds. He was in shock and cyanotic. The sclera of the left eye showed several hemorrhages. The pharynx was injected and edematous. The tongue was coated. Moist rales were heard throughout both lungs. Physical examination of the heart was not satisfactory. A questionable to-and-fro rub was heard over the precordium. The abdomen was soft, with no palpable masses. Neurologic examination was negative.

The pulse was 100, and the respirations 20 and deep. The blood pressure was not obtainable.

*On leave of absence.

The hemoglobin was 136 per cent. The white-cell count was 16,250 on admission, and 5800 an hour later. An electrocardiogram was normal. The chest film was unsatisfactory, and only gross consolidation could be ruled out.

A catheter was passed, but no free urine was obtained. He rapidly failed and died two hours after entry.

DIFFERENTIAL DIAGNOSIS

DR. ALFRED KRANES: Some years ago I had occasion to check our diagnostic accuracy on patients admitted in a comatose condition to the Emergency Ward and dying an hour or two afterward. I found that it was discouragingly low. With that in mind one approaches a problem like this with a good deal of misgiving.

We are confronted with a patient who died after four days of intensive, painless diarrhea and vomiting, initiated by chills and fever. Certainly the etiology of this man's disease is far from clear, but I think that the mechanism of his death is reasonably certain. The large amount of fluid lost from the gastrointestinal tract produced such marked dehydration, as evidenced by the clinical findings and the hemoglobin of 136 per cent, that shock and urinary suppression followed. Most diseases causing such a rapidly fatal diarrhea are not encountered in this part of the world, and even those that are seen here occur but rarely. If one met a problem like this in other parts of the world one would have little doubt that the patient died of cholera. But cholera is nonexistent in New England. I mention it chiefly because this is a textbook picture of the disease and because it illustrates so well how such patients die.

So far as the causes of this chain of events in this section of the world are concerned, perhaps the most probable is acute bacillary dysentery. Certainly the onset, with chills and fever, and the subsequent events make one suspect an acute infectious process in the gastrointestinal tract, the most frequent of which is bacillary dysentery. I saw a great deal of bacillary dysentery both in North Africa and in Italy. The mortality was zero, but this was not due to the efficacy of treatment since many of the patients received no chemotherapy. The cases were mild or, at most, moderately severe. Acute bacillary dysentery, however, carries a definite mortality, and in some outbreaks

it has been as high as 50 or 60 per cent. I am sure that the mortality is largely influenced by the fact that many of these patients suffer from other debilitating diseases or from chronic malnutrition, such as the cases found in the German prison camps, the dysentery being merely the terminal event. It seems to me remarkable for an otherwise healthy man in a community where bacillary dysentery is not endemic to have been stricken by such an acutely fatal type of the disease. Furthermore, patients with even mild bacillary dysentery have a good deal of abdominal pain as well as bloody stools, neither of which this patient had. I do not know how accurately the stools were observed, nor do I know that any were examined here in the hospital, but it would be unusual for a patient dying of bacillary dysentery not to have some pain and usually a good deal of blood in the stools. For that matter, any acute intestinal infection leading to such a rapidly fatal termination would be expected to have abdominal pain to a considerable degree, as well as bloody stools. I am forced to overlook the absence of these two findings in this patient, the history perhaps being unreliable and the stools not accurately observed.

The same objections can be applied to a disease somewhat more frequently found in this community, namely, amebic dysentery. Amebiasis, as we all know, is apt to run a much more chronic course than this, but there is an acute form that is rapidly fatal, although I have never heard of one dying quite so rapidly as this. I see no way of distinguishing between the two types, except on laboratory evidence, which is not available. I presume that the patient was in the hospital such a short time that no stool cultures were obtained. At any rate if they were, they probably were not reported until after death.

There is one other type of acute infection of the gastrointestinal tract that is much oftener found here, namely, acute ulcerative colitis of the idiopathic type. It can occasionally run an extremely fulminating course. I have never heard of a patient's dying within four days of the onset, although I can recall one who died within ten days. Those cases usually manifest signs of fulminating sepsis and have marked disturbance of the gastrointestinal tract, with abdominal pain and bloody stools. The absence of bloody stools, however, in the idiopathic type of ulcerative colitis is somewhat less disturbing than in the other two diseases that I have mentioned. I believe that this patient had some form of ulcerative colitis, some infection of the gastrointestinal tract. I do not see how one can distinguish on clinical grounds whether it was of the idiopathic variety or whether it was bacillary or amebic. In the absence of the laboratory investigation one can only guess concerning the etiology.

In a patient dying as rapidly as this from such an acute and severe diarrhea, I think that one has a right to inquire whether poisoning played a role, particularly since the symptoms came on while eating breakfast. The two most frequent types of poison that would be expected to produce a picture like this are arsenic and mercury. I do not see any way to exclude them. In a patient coming in with this picture one has to keep poisoning in mind. So far as arsenic goes, which is somewhat likelier than mercury, if it were administered while he was having breakfast one would not expect the symptoms to come on so soon. Usually several hours elapse, whereas with mercury, the intestinal symptoms come on sooner. Either can produce this picture, with diarrhea, shock and hemoconcentration and renal suppression. Somewhat against poisoning as a possible cause is the fact that the patient's illness started with chills and fever, making it much likelier that an acute infectious process was behind it all.

While we are on the subject of poisoning, I think that it would be relevant to inquire what possible role the sulfonamides played in the production of the urinary suppression. We are told that this patient was anuric from the onset of his illness, which seems to indicate that sulfonamides probably played no role. Certainly the urinary picture could have been the logical result of the disease without the additional effect of the sulfonamides. If chemotherapy played any role, one would like to know several things not listed in the history. One would like to know what preparation was administered. If sulfaguanidine were used, one would not expect it to have a deleterious effect on the kidneys. On the other hand, sulfadiazine in a patient as dehydrated as this one was might produce considerable damage. One would also like to know whether he retained the sulfonamide. Since he was vomiting, it is conceivable that medication was not retained. In the absence of any additional information, all I can do is to mention the possibility of tubular damage secondary to sulfonamide administration; I see no way of settling the problem.

DR. RONALD C. SNIFFEN: There was a trace of sulfadiazine in the blood.

DR. KRANES: Apparently some of it was retained.

It remains to consider whether any lesion outside the gastrointestinal tract could have been responsible for the chain of events described here. I cannot think of anything of this sort that explains the picture to my complete satisfaction. There is one thing that ought to be mentioned, namely, acute adrenal insufficiency. Patients with Addison's disease in whom an acute adrenal crisis develops have exactly this picture, — severe nausea, vomiting and diarrhea with enormous fluid loss, — go into shock with renal suppression and die in this manner. It would explain many of the things that the other diagnoses do not explain, particularly the absence of blood in the stools. But I do not see how we can make such a diagnosis in the absence

of any confirmatory finding. No mention is made of pigmentation, nor are we told anything about the previous state of health. It would be unlikely for acute adrenal insufficiency to manifest itself as suddenly as this. Furthermore, the onset with chills and fever is decidedly against it.

So far as any disease above the diaphragm is concerned, I do not see how anything in his heart could have been responsible. To be sure, we have mention of a to-and-fro pericardial friction rub. That may or may not have been present, and even if it were, it can be explained on the basis of the uremia, since many patients dying of uremia develop a sterile pericarditis. So far as a lesion in the lung goes, I cannot quite reconcile it with the rest of the picture. May we see the x-ray film of the chest?

Dr. Clayton H. Hale: This film was taken under considerable difficulty and is not satisfactory. It was taken in expiration while the patient was sitting in bed. There is no definite disease demonstrated anywhere in the lung. The heart has been pushed up considerably by the high diaphragm.

Dr. Kranes: Concerning the rales heard in the chest, it is not unusual for moribund patients such as this to show a certain amount of moisture in their lungs. It does not necessarily indicate an inflammatory exudate.

In conclusion, I can make no other diagnosis than some acute ulcerative infection of the gastrointestinal tract. On the basis of probability in this community, an idiopathic type of ulcerative colitis is the likeliest condition; bacillary dysentery is less likely.

Dr. William Beckman: I was asked to see this man late in the evening. No record had been written at that time, and my remarks were therefore not recorded. The thing that struck me most was his respiratory distress.

Dr. Kranes: The rate was 20.

Dr. Beckman: I did not count the respirations but I should have said that they were faster than that. I was probably wrong, but I thought that he had a massive pulmonary embolus. To know that he did present respiratory distress may influence your opinion.

Dr. Kranes: I do not believe so. If this patient did have an acute infection in the lungs, such as pneumonia, it is difficult for me to reconcile such an infection with the gastrointestinal symptoms. One thing that did occur to me was the possibility of some acute surgical condition in the abdomen. Since you have mentioned an acute pulmonary embolus, the thought comes to mind that this man might have had an acute mesenteric thrombosis. If he did, it was a most unusual one.

Dr. Sniffen: Dr. Berg, you also saw this man. Have you anything to add?

Dr. Robert Berg: I thought that the whole picture was that of a man who had chills and fever and other evidence of infection and then went into shock and died. We thought that he had an overwhelming infection. We considered cholera and asked his wife about the nature of the stools. When specifically asked, she said, "Yes, they were rice water in character." But it was a leading question and could not be relied on. We thought that he might have had dysentery, but that is as far as we could go.

Dr. George Cotzias: Dr. Charles A. Janeway, when seeing a similar patient in consultation, said that with a severe gastrointestinal upset but with no blood in the stools and no tenesmus or cramping one must think of scarlet fever, influenza and meningitis. These conditions are quite frequently missed in patients presenting this picture.

Dr. Donald S. King: Could liver disease have caused the diarrhea?

Dr. Kranes: I do not see how liver disease could logically have explained the symptoms.

Dr. King: Neither can I.

Dr. Milton H. Clifford: Does not cholera respond quite rapidly to sulfonamides?

Dr. Kranes: I do not know. I have never seen a case, but I do not believe that we even need to consider cholera.

Dr. Richard J. Clark: Since there were scleral hemorrhages and possibly a pericarditis, what about an overwhelming pneumonia with a renal complication on top of that?

Dr. Kranes: I attribute the scleral hemorrhages to persistent vomiting, but I may be wrong in doing so. I believe that any acute overwhelming infection, regardless of its nature, may produce nonspecific gastrointestinal symptoms; in other words, it is not necessary to postulate a primary lesion in the gastrointestinal tract to give this picture. Further than that, what sort of overwhelming infection he might have had is a pure guess.

Clinical Diagnosis

Bacillary dysentery.

Dr. Kranes's Diagnosis

Acute ulcerative colitis, idiopathic type.

Anatomical Diagnosis

Acute hemorrhagic interstitial pneumonia.

Pathological Discussion

Dr. Sniffen: At autopsy, one was impressed by the signs of toxicity. The liver was enlarged and friable, the splenic pulp was mushy, and the various lymph nodes were hyperplastic. The gastrointestinal tract was normal except for a striking hyperplasia of the lymphoid tissue. The kidneys were swollen and soft. Petechial hemorrhages had occurred beneath the endocardium of the left ventricle. The pericardial cavity was normal. At first glance the lungs seemed to blend into the general background, for they were wet with a hemorrhagic fluid. Yet they were a little too firm and

airless to be merely hyperemic and edematous, and the right middle lobe was practically normal. Our suspicions were confirmed by the sections, which showed microscopically a severe hemorrhagic interstitial pneumonia. The bacteriologic studies were inconclusive, since the lungs had been sectioned before cultures were taken; colon bacilli and an anaerobic streptococcus grew out.

I have reviewed sections of lungs removed at autopsy in this hospital during the influenzal epidemic of 1918, and the sections from this case compare favorably with them and with the reports in the literature. The alveolar walls were hyperemic, and the interstitial exudate consisted predominantly of mononuclear cells, with pronounced edema and hemorrhage into the alveolar walls and spaces. In contrast to this there was a purulent bronchitis, with polymorphonuclear cells infiltrating the bronchial walls and sometimes the neighboring alveoli.

We do not pretend that this was a case of influenzal pneumonia, but it was one of fulminating hemorrhagic pneumonia.

DR. KRANES: Did you do a post-mortem blood culture?

DR. SNIFFEN: Yes; it showed the same organism as the lungs, and we could draw no conclusions.

DR. KING: Was the cyanosis the ashen gray type that we saw with influenza?

DR. BECKMAN: It did not seem so to me.

DR. KING: In the influenza epidemic one could almost diagnose the disease from the character of the cyanosis.

DR. BECKMAN: He looked like a patient with massive pulmonary embolism who was in collapse.

DR. W. WILSON SCHIER: Did the adrenal glands show any damage?

DR. SNIFFEN: No.

CASE 31512

PRESENTATION OF CASE

A fourteen-year-old schoolgirl was sent to the hospital because of marked difficulty in speaking.

Prior to the present trouble the patient had apparently been quite well. Approximately five months before entry she noticed that articulation was becoming progressively more difficult. At that time she also began to salivate excessively. Her physician prescribed pills, but these did not relieve her. Three weeks before entry visual perception of distant objects was reduced, but she was able to read quite well. On three successive mornings she had vomited; she had not felt nauseated, and the vomiting was not projectile. Two months before entry the patient began to feel dizzy while walking; she tended to reel, stagger and bump into objects but did not fall. Her parents noticed a "side-to-side movement" of the eyes. At that time she also complained of gagging and coughing while drinking fluids. Only once, and then for just an hour in the morning, did she have a headache. There was no tinnitus, loss of hearing, diplopia, paresthesia or numbness of the face or extremities, nor any weakness of the extremities. She was able to maintain satisfactorily her scholastic progress in the second year of high school.

The family and past histories were noncontributory.

Physical examination disclosed a well developed but poorly nourished adolescent girl who seemed quite comfortable. Her voice had a thick nasal quality. Vision was 20/70 in both eyes, correctable to 20/50 with a pinhole. The fundi were normal. There was a vertical nystagmus, as well as a horizontal nystagmus, on left lateral gaze. The patient could read best with her head tilted to the right and backward, thereby reducing the nystagmus. The left pupil was 6 mm. in diameter, and the right 5 mm. Both were round and reacted well to light and accommodation. There was no diplopia. Ocular movements were normal. There was slight weakness of the muscles on the left side of the face, and the patient could not whistle. Hearing was not impaired. Finger-to-nose and heel-to-shin tests brought out slight unsteadiness on the left side; they were normal on the right. There was no tremor of the extremities. The palate deviated to the right, and the gag reflex was absent. The patient choked on drinking water. The tongue could be extended only a few millimeters. There was weakness of flexion and rotation of the head and neck. There were no sensory disturbances or weakness of the muscles of the extremities. The abdominal reflexes were slightly reduced on both sides, and the plantar reflexes were equivocal. The arm, knee and ankle jerks were normal. The patient walked on a broad base with a reeling gait and had a tendency to stagger or fall to the left. The Romberg test was negative. The heart, lungs and abdomen were normal.

The temperature was 98°F., the pulse 92, and the respirations 20. The blood pressure was 110 systolic, 70 diastolic.

Examination of the blood revealed a hemoglobin of 14.0 gm., and a white-cell count of 6600, with 73 per cent neutrophils. A blood Hinton test was negative. The urine was normal. X-ray studies of the skull, cervical spine and chest were negative. A lumbar puncture demonstrated an initial pressure equivalent to 120 mm. of water, which rose to 150 mm. after compression of both jugular veins. This did not drop when the compression was released. The spinal fluid was clear, and no cells were found microscopically. The total protein was 16 mg. per 100 cc., and the Wassermann test was negative.

On the tenth day the patient aspirated some milk that she was trying to drink. She rapidly became cyanotic and lost consciousness, and artificial respiration was instituted. The patient was

put into a respirator but did not regain consciousness. The temperature rose to 105.8°F., and the pulse to 160. After the administration of oxygen, the cyanosis cleared slightly. Corneal reflexes were absent, and there was no response to painful stimuli. The eyes were partly open, and there was a bilateral twitching of the upper lids. The pupils were large and reacted slightly to light. There was little tone in the arms, but more in the flexors than in the extensors. The legs were flaccid. The biceps, triceps and knee jerks were extremely weak.

Three hours later convulsive movements of the fingers and arms developed, but they were never violent. The fundi were normal. The patient remained unchanged for six hours, when muscular twitchings increased. The pupils became smaller but still reacted to light. Prior to death, the respirations became shallow and infrequent and the patient seemed to be choking. She died twelve hours after the onset of the attack of respiratory difficulty.

Differential Diagnosis

Dr. Arthur Watkins: This case seems to be one of a rather rapidly progressing neurologic disorder. Before discussing the nature of the pathologic process, I shall first try to localize it anatomically.

The chief complaint, and also the first complaint, was difficulty in speaking. This began five months before admission to the hospital and was a defect of articulation rather than any type of aphasia. One at once suspects some weakness of the vocal cords or palate, from a lesion of the tenth cranial nerve. We next learn that the patient salivated excessively, probably because of difficulty in swallowing, again on the basis of a palsy of the tenth cranial nerve. The fact that pills, probably atropine, did not relieve this is consistent. Three weeks before entry there was some diminution of vision, which might have been due to increased intracranial pressure, particularly so because the record states that she vomited without nausea, but since she had a headache only once, we cannot be sure of this. The vomiting may have been due to vertigo, since she felt dizzy while walking and was noted to have a staggering gait together with a "side-to-side movement" of the eyes, presumably nystagmus. I have already suggested a lesion of the tenth nerve to explain her speech and swallowing difficulties. A lesion of the ninth nerve could also make the gag reflex on swallowing difficult, and the symptoms of unsteady gait and nystagmus suggest involvement of the vestibular pathways from the eighth nerve or the descending cerebellar tract. From the history so far, we can suspect a lesion in the brain stem involving the nuclei of the eighth, ninth and tenth nerves. The acoustic portion of the eighth nerve seems to be eliminated through the absence of tinnitus and of diminution of hearing, and the history suggests no involvement of the extraocular muscles or of the long sensory and motor tracts. The cerebral hemispheres seem to have been functioning, since she was able to maintain her school work.

Physical examination gave no indication of disease outside the central nervous system. Her voice was described as thick and nasal, suggesting that the speech defect was not in the loss of co-ordinated movement necessary for articulation, such as might result from a cerebellar or cerebral lesion, but due to weakness of the pharyngeal muscles. The extraocular movements were normal. The pupils were only slightly unequal in size, the right being smaller than the left, which makes one wonder about a beginning Horner's syndrome. There was some left facial weakness, indicating that the lesion might have been as high as the seventh cranial nerve. We have further evidence of dysfunction of the vestibular tract or of the connection between the vestibular nucleus and the cerebellum in the inaccurate finger-to-nose and heel-to-shin tests and the reeling gait with a tendency to fall to the left, the negative Romberg test showing that sensation in the extremities was normal.

We next find a suggestion of twelfth-nerve involvement in the weakness of tongue musculature, and that of the eleventh nerve in the weakness in flexion and rotation of the head and neck. The sensory and motor tracts of the extremities were apparently unaffected. The history and physical findings, therefore, lead us to suspect a lesion in the anterior portion of the brain stem affecting primarily the nuclei of the tenth nerve, with extension upward to the seventh and downward to the twelfth. While in the hospital, the patient developed respiratory paralysis, indicating involvement of the respiratory centers in the medulla, and finally died. She did lose consciousness but this seems likelier to have been due to respiratory difficulty or possibly an increase in intracranial pressure than to any primary involvement of the cerebrum. One might consider the possibility of a pseudobulbar palsy from a bilateral supranuclear lesion, but in the absence of pyramidal-tract signs this seems to be excluded.

Having decided that the lesion was localized to the brain stem, we shall now consider the nature of the lesion. We can first of all exclude an infectious process because of the absence of generalized signs of infection and because of the absence of meningeal signs and abnormalities in the cerebrospinal fluid. Degenerative conditions must then be considered. First of all comes bulbar palsy of the type associated with progressive muscular atrophy. The rapidity of the course and the absence of fibrillation of the tongue muscles or of the neck muscles make this extremely unlikely. Syringobulbia is another possibility, but again the course is too rapid and in this disease there are usually sensory symptoms through involvement of the spinal root of the fifth cranial nerve. In view of the nystagmus and difficulty in walking, degeneration of the cerebellar

tract might be considered, such as Marie's ataxia, but the negative family history and the signs of cranial-nerve involvement easily exclude this diagnosis. An aneurysm may involve the upper cranial nerves, but it would not explain the sequence of events in this case. The steady progression of symptoms is against a vascular thrombosis.

We are left then with a diagnosis of tumor, which seems the most probable. The early involvement of the cranial nerves before long-tract signs and without much evidence of increase in intracranial pressure, favors a tumor arising within rather than outside the brain substance. This was probably a rapidly growing glioma, such as a spongioblastoma. Medulloblastoma might be thought of, particularly in this age group, but such a tumor is usually located in the fourth ventricle and cerebellum. There was probably a terminal pulmonary infection because of the difficulty in swallowing. My diagnosis therefore is glioma of the brain stem, with secondary bronchopneumonia.

Clinical Diagnoses

Bulbar palsy (cause unknown).
Aspiration asphyxia.

Dr. Watkins's Diagnoses

Glioma of brain stem.
Bronchopneumonia.

Anatomical Diagnoses

Glioblastoma multiforme of medulla.
Asphyxia.
Bronchopneumonia.

Pathological Discussion

Dr. Charles S. Kubik: Postmortem examination revealed a large glioma of the medulla, involving the left half much more than the right. The tumor did not invade the pons. Histologically it was a glioblastoma multiforme, like most of the other gliomas of the brain stem that have been examined in this laboratory. There was early bronchopneumonia.

The terminal episode was unquestionably due to asphyxia resulting from aspiration of fluid. Before the air passages could be cleared, the brain had suffered such severe damage that the patient never regained consciousness. Hyperthermia, which occurred in this case, has been regularly observed after severe asphyxia resulting in a prolonged course or death.

An interesting and, in my experience, a unique feature was the lack of any paresthesia or sensory loss. It might be added that this was looked for with the greatest care on numerous occasions.

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Journal of Medicine

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Established 1828

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CHRISTMAS 1945

Christmas, this year, will be celebrated with mixed emotions. War, as usual, has been immediately succeeded not by peace on earth and in the hearts of men, but by frustration, bitterness, suspicion and anxiety for the future. Wounds cannot heal so quickly, nor can scars be changed into normal tissue. We have, it is true, the happiness of many reunited families to give us joy, and the fact that the greater strife has ceased; we also have the recollection of those families that will never be reunited again, of the many thousands of physically and mentally crippled veterans who will continually challenge our right to the complacent enjoyment of a re-established freedom, and of our lack, still, of the essential factor of good will among nations.

Since Christmas is the day of giving and receiving gifts, however, we are hoping for certain gifts this year — to be given and received by all — that have been missing since these troubled seasons began. They are not the gifts of soft living to replace hard living or of moral relaxation to replace moral vigor. They are rather those intellectual gifts that will enable their possessors to adapt themselves to their present without looking back too reluctantly on their past, that will guide them to the acceptance of a method of living and a manner of thought necessary for the future survival of the nations.

What the world is hungering for this Christmas is not a new mechanical toy or a more complicated piece of machinery than we have ever seen before, or a form of energy that will set a million men adrift upon a sea of idleness. It is not the product of mechanical minds that we now need, but a light to shine, as we must believe it will shine, to show us the way and give us the will for seeing and understanding each other's problems and each other's hopes.

It is not so much peace on earth and good will to men that we are wishing for this Christmas as it is good will among men in order that there may be peace on earth. Good will is not a product of the peace table or a handout of the politicians. It is a force that must come into the minds of each individual and be strengthened in the circle of each family, for inevitably the future of the world must depend on the will of those who inhabit it.

As Esaias the prophet once said, "The people which sat in darkness saw great light; and to them which sat in the region and shadow of death light is sprung up." — *Matthew* iv, 16.

INFLUENZA

Between 1920 and 1944, there were sixteen epidemics of influenza in the United States. At least six of them were nation wide, and the rest were

limited to various parts of the country. In each of the epidemics that occurred subsequent to 1932, the presence of influenza A or B virus was demonstrated either by serologic tests or by isolation from cases.

The last extensive epidemic occurred in the latter part of 1943 and early in 1944. In that epidemic, influenza A virus was isolated from cases in many widely separated areas throughout the United States and in Great Britain. The epidemiologic information concerning that epidemic indicates that it was of major proportions, the largest since that of 1928–1929. Although complications and case fatality rates in that outbreak were low, the effect of this epidemic on the total mortality, by virtue of the high incidence, was greater than the case fatality rate seemed to indicate.

During this epidemic, the Commission on Influenza of the United States Army made a fairly extensive study of the effect of vaccination with formalinized influenza A and B virus suspensions, concentrated from the allantoic fluid of infected chick embryos. A summary of the results was published last spring,[1] and the details of that study, which was made by several groups of workers in different parts of the United States, have been recently reported.[2] A definite reduction in the incidence of cases occurred in the vaccinated as compared with the control persons within the same groups. The ratio of the incidence of cases among controls to that among vaccinated subjects varied, in the experiences of different workers, from as little as 1.4:1 in California to as high as 6.0:1 in one group of subjects in New York City.

The full effectiveness of this method of vaccination, however, still remains to be demonstrated. Certainly little if any benefit can be expected from the vaccination of any group or community after an outbreak of influenza has already reached its peak. Furthermore, since the immunity from vaccination probably does not persist for more than a few weeks or months, it must be undertaken somewhat in advance of the occurrence of an epidemic. Reactions to the injections of the vaccine, although not frequent, have nevertheless been observed and in some persons have been quite severe. Sensitization to egg protein is a possibility and may be quite a serious matter in persons with allergic tendencies. The last is equally true of vaccines used for immunization against viral or rickettsial diseases, most of which are prepared from infected eggs, and undoubtedly many of the troops who were vaccinated against yellow fever or typhus fever have been sensitized to egg protein. All such vaccines must therefore be administered under careful supervision and control.

According to news reports, a significant proportion of the personnel of the United States Army who are still in active service have been injected with a vaccine similar to the one tested by the Commission on Influenza. There is no indication, however, that the other services have seen fit to follow this example. The supply of the vaccine has been limited, and little will be available for civilian use.

In recent weeks there has been evidence of outbreaks of influenza in various parts of Europe and on this continent. In each area where studies have been made, the presence of influenza B virus has been demonstrated. This is encouraging, for in the past, epidemics due to influenza B virus were neither so widespread nor so severe as those due to influenza A virus. Individual cases, however, have shown a similar variation in severity, regardless of the viral agent.

The Commission on Acute Respiratory Diseases of the United States Army and the New York State Department of Health[3] have recently called attention to the fact that outbreaks of influenza have

MASSACHUSETTS MEDICAL SOCIETY POSTWAR LOAN FUND

The Postwar Loan Fund has been set up, and all discharged medical officers who were members of the Massachusetts Medical Society in good standing at the time of their entry into the service may apply for loans from this fund. For further information apply to:

George L. Schadt, *Chairman*
Postwar Loan Fund
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always been accompanied by a sharp increase in mortality from pneumonia. It will be recalled that during the pandemic of 1918 the pneumonias that accompanied the influenza were of unusual severity and were associated with a high case fatality. Although the nature of the virus that probably was the causative agent of that pandemic is not known, bacteriologic studies of the pneumonias indicated that the bacteria varied in different localities; the influenza (Pfeiffer) bacillus, hemolytic streptococci, pneumococci and staphylococci were the predominant organisms. During an outbreak of influenza A virus infection in Boston in 1940–1941, there appeared to be an increase in the incidence of staphylococcal pneumonias,[4] and in the one of 1943–1944, an increase in the frequency and severity of pneumococcal pneumonias was noted.[5] In 1940, the presence of influenza B virus infections was demonstrated during an epidemic of Type 1 pneumococcus pneumonia in a small community in upstate New York.[3]

Bacterial pneumonias have not been unusually severe or frequent since the influenza epidemic of 1943–1944. Should influenza spread in the community, there may be an increase in the incidence and severity of pneumonia during the early part of the present season, but effective agents are now available in the form of sulfonamides and penicillin. These must be used intelligently to yield the maximum benefit. The administration of occasional or subeffective doses of either of these agents as a preventive of pneumonia may give an unwarranted sense of security to both the patient and the physician and the application of effective full-dose therapy may thereby be delayed to a point at which it will be of no avail. When these agents are indicated they should be given intensively until their full effects are obtained. It is well to bear in mind that the pneumonias complicating influenza may be severe and fulminating in character. Some of them, to be sure, may be due to a pure virus infection and cannot be influenced by any specific treatment that is now available. On the other hand, most of them are bacterial complications of the primary viral infection and should be treated as such.

Repeated warnings have recently been given about an impending shortage of penicillin. This is now real and present. Many large communities have been forced to ration penicillin informally, and controls on distribution by the Civilian Production Board are almost inevitable. It is well recognized by every physician that by far the greatest proportion of penicillin is prescribed for conditions in which no benefit can be expected, that dosages are excessive, that treatment is unnecessarily prolonged and that amounts beyond all reason are wasted by oral administration. Should the influenza epidemic be complicated by staphylococcal pneumonias or by infections with hemolytic streptococci that are not susceptible to sulfonamides, a real danger exists that many persons will die because of an inadequate supply of penicillin for the treatment of these secondary infections, and this will be solely attributable to the wasteful and unwarranted use of penicillin in conditions in which it is not specifically indicated. The intelligent use of the supplies of penicillin currently made available, however, should guarantee an amount of the drug that will be more than ample to meet any emergency.

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MASSACHUSETTS MEDICAL SOCIETY

DEATHS

CREGG — Francis A. Cregg, M.D., of Methuen, died November 30. He was in his sixty-fifth year.

Dr. Cregg received his degree from Jefferson Medical College of Philadelphia in 1905.

WHITE — Levi White, M.D., of Worcester, died December 1. He was in his ninety-seventh year.

Dr. White received his degree from Bellevue Hospital Medical College, New York, in 1872. At first he practiced in East Douglas and then in Milford, but in 1900 he moved to Worcester, where he had continued in active practice until two years before his death. He was the oldest living member of the Massachusetts Medical Society.

His widow survives.

MISCELLANY

ADVISORY BOARD ON HEALTH SERVICES FOR RED CROSS

Basil O'Connor, national chairman of the American Red Cross, recently announced appointment of an Advisory Board on Health Services to co-ordinate activities of the American Red Cross in the health field. Mr. O'Connor

named as board chairman Lewis H. Weed, M.D., of Baltimore, who is also chairman of the Division of Medical Sciences, National Research Council, and director of the School of Medicine, Johns Hopkins University.

The committee consists of one hundred and nine men and women from twenty-five states and the District of Columbia, representing every specialty in the field of health. Not only physicians were appointed, but also nurses, dentists, health educators, medical and psychiatric social workers, hospital administrators, medical publicists, nutritionists, pediatricians, public-health administrators and sanitary engineers.

The new group was appointed as a result of a recommendation made by the Special Medical and Health Survey Committee, which Mr. O'Connor named in October, 1944, to study Red Cross health programs and make recommendations. Other recommendations of the survey group, such as the Red Cross civilian blood-donor program, are already being carried out and still others are under consideration by the Red Cross central committee. The following departments are among those on whose programs the new board will advise: nutrition; nursing; home nursing; nurse's aides; first aid, water safety and accident prevention; medical aspects of home service; hospital service; civilian relief; disaster relief; and canteen corps and nutrition aides.

COLONEL LANMAN AWARDED LEGION OF MERIT

Colonel Thomas Hinckley Lanman, M.C., A.U.S., on leave of absence as a member of the Surgical Staff of the Children's Hospital and as assistant professor of surgery at the Harvard Medical School, was recently awarded the Legion of Merit by direction of the President. The citation reads as follows:

> For exceptionally meritorious service in the performance of outstanding service as surgical consultant for the 12th Hospital Center. Colonel Lanman displayed outstanding judgment, zeal, and devotion to duty in directing the surgical policies for the care of thousands of battle casualties. This has resulted in the saving of life, in the prevention of serious complications and in shortening the time of incapacity.

CORRESPONDENCE

DEPRIVATION OF LICENSES

To the Editor: At a meeting of the Board of Registration in Medicine held November 30, the Board took the following actions:

To revoke the license of Dr. Lillian M. Lawford, 210 Maverick Street, East Boston, because of gross misconduct in the practice of her profession as shown by an illegal abortion.

To suspend for one year the license of Dr. John H. Walker, formerly of 665 Broad Street, Weymouth, and now of Rockland, Maine, because of gross misconduct in the practice of his profession as shown by violation of the federal narcotic law.

H. Quimby Gallupe, M.D., *Secretary*
Board of Registration in Medicine

State House
Boston

BOOKS RECEIVED

The receipt of the following books is acknowledged, and this listing must be regarded as a sufficient return for the courtesy of the sender. Books that appear to be of particular interest will be reviewed as space permits. Additional information in regard to all listed books will be gladly furnished on request.

Constitution and Disease: Applied constitutional pathology. By Julius Bauer, M.D., professor of clinical medicine, College of Medical Evangelists, Los Angeles, senior attending physician, Los Angeles County General Hospital, and consultant in medicine, Cedars of Lebanon Hospital, Los Angeles. Second edition, revised and enlarged. 8°, cloth, 247 pp. New York: Grune and Stratton, 1945. $4.00.

The text in this new edition of a standard monograph, first published in 1942, has been amplified by the author and new citations covering the most recent literature have been added to the text, constituting a considerable addition to the bibliography of the subject.

NOTICES

ANNOUNCEMENTS

Dr. Edward A. Edwards, having recently returned from overseas duty with the Army, announces the reopening of his office at a new location, 29 Lewis Avenue, Great Barrington.

Dr. Laurence B. Ellis announces the reopening of his office at 319 Longwood Avenue, Boston, for the practice of internal medicine and cardiology.

Dr. Burton C. Grodberg, having returned from active service with the United States Army, announces the opening of his offices at 640 Main Street, Malden, and 353 Commonwealth Avenue, Boston, for the practice of obstetrics and gynecology.

Dr. Harold D. Levine, recently discharged from military service, announces the opening of his office at 171 Bay State Road, Boston, for the practice of internal medicine and cardiology.

Dr. Joseph Prenn announces the opening of his office at 483 Beacon Street, Boston, for the practice of ear, nose and throat.

NEW ENGLAND OTO-LARYNGOLOGICAL SOCIETY

The annual meeting of the New England Oto-Laryngological Society will be held in conjunction with the American Laryngological, Rhinological and Otological Society, Incorporated, Eastern Section, at the Hotel Statler, Boston, on Wednesday, January 9, at 9:30 a.m.

The annual dinner of the Society will be held at the Harvard Club at 6:00 p.m. The guest speaker will be Dr. Julius Lempert, of New York City.

HELEN PUTNAM FELLOWSHIP

Radcliffe College invites application for the Helen Putnam Fellowship for Advanced Research in the general field of genetics or of mental health. The fellowship, carrying a stipend of $2000 and covering a period of eleven months, from October 1, 1946, is open to mature women scholars who have gained their doctorate or possess similar qualifications, and who have research in progress. All normal laboratory facilities will be provided to the winner of the Putnam Fellowship, whose appointment will be announced about May 1st by the Committee on award. Applications for the award must be submitted to Radcliffe College, Cambridge, Massachusetts, not later than April 1, 1946.

AMERICAN COLLEGE OF PHYSICIANS

The American College of Physicians will resume its annual meetings in 1946. The first postwar meeting will be held at the Philadelphia Municipal Auditorium from May 13 to 17 inclusive. The meeting will be conducted under the presidency of Dr. Ernest E. Irons, of Chicago, and the general chairmanship of Dr. George M. Piersol, of Philadelphia.

AMERICAN BOARD OF OPHTHALMOLOGY

The American Board of Ophthalmology announces the following examinations in 1946: Chicago, January 18–22; New York City, approximately April 10–13; San Francisco, June 22–25; and Chicago, October 9–12.

(*Notices continued on page xv*)

NOTICES (*Continued from page 798*)

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING THURSDAY, DECEMBER 27

FRIDAY, DECEMBER 28
*9:00-10:00 a.m. Medical clinic. Isolation Amphitheater, Children's Hospital.
*10:00 a.m.-12:00 m. Medical staff rounds. Peter Bent Brigham Hospital.
10:50 a.m. Recent Advances in Cutaneous Medicine. Dr. George E. Morris. (Post-graduate clinic in dermatology and syphilology.) Amphitheater, Dowling Building. Boston City Hospital.

MONDAY, DECEMBER 31
*12:00 m.-1:00 p.m. Clinicopathological conference. Peter Bent Brigham Hospital.

WEDNESDAY, JANUARY 2
*12:00 m. Clinicopathological conference. Children's Hospital.
*12:00 m.-1:00 p.m. Clinicopathological conference. Cambridge Hospital.

*Open to the medical profession.

JANUARY 7-APRIL 22, 1946. Metropolitan State Hospital. Eleventh postgraduate seminar in neurology and psychiatry. Page 314, issue of September 6.
JANUARY 9. New England Oto-Laryngological Society. Page 798.
JANUARY 10. Fatigue, Its Significance and Treatment. Dr. Frank N. Allan. Pentucket Association of Physicians. 8:30 p.m. Haverhill.
FEBRUARY 2. American Board of Obstetrics and Gynecology. Page 514, issue of October 25.
FEBRUARY 4-MARCH 29. Health Education Institute. Page 746, issue of December 13.
MAY 13-17. American College of Physicians. Page 798.

DISTRICT MEDICAL SOCIETY

WORCESTER

JANUARY 9. St. Vincent Hospital.
FEBRUARY 13. Worcester State Hospital.
MARCH 13. Worcester Memorial Hospital.
APRIL 10. Hahnemann Hospital.
MAY 8. Annual meeting.

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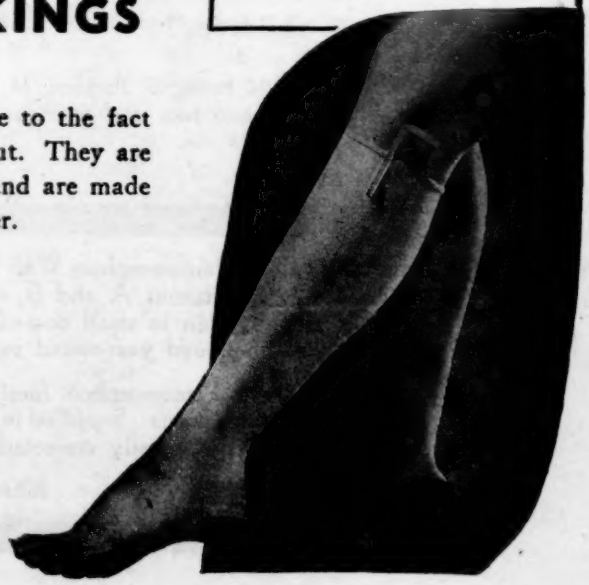

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SHOULD VITAMIN D BE GIVEN ONLY TO INFANTS?

VITAMIN D has been so successful in preventing rickets during infancy that there has been little emphasis on continuing its use after the second year.

But now a careful histologic study has been made which reveals a startlingly high incidence of rickets in children 2 to 14 years old. Follis, Jackson, Eliot, and Park* report that postmortem examination of 230 children of this age group showed the total prevalence of rickets to be 46.5%.

Rachitic changes were present as late as the fourteenth year, and the incidence was higher among children dying from acute disease than in those dying of chronic disease.

The authors conclude, "We doubt if slight degrees of rickets, such as we found in many of our children, interfere with health and development, but our studies as a whole afford reason to prolong administration of vitamin D to the age limit of our study, the fourteenth year, and especially indicate the necessity to suspect and to take the necessary measures to guard against rickets in sick children."

*R. H. Follis, D. Jackson, M. M. Eliot, and E. A. Park: Prevalence of rickets in children between two and fourteen years of age, Am. J. Dis. Child. 66:1-11, July 1943.

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